DOCUMENT RESUME

ED 059 780 PS 005 444

AUTHOR	Butler, Annie L.; And Others
TITLE	Literature Search and Development of an Evaluation System in Early Childhood Education. I. Researched Characteristics of Preschool Children.
INSTITUTION	Indiana Univ., Bloomington.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
PUB DATE	Apr 71
CONTRACT	OEC-0-70-5033-284
NOTE	400p.
EDRS PRICE	MF-$0.65 HC-$13.16
DESCRIPTORS	Anglo Americans; Behavior Change; *Bibliographies; Child Development; Data Analysis; Data Collection; *Early Childhood Education; *Evaluation Techniques; Federal Programs; *Individual Characteristics; Negro Youth; Objectives; *Preschool Children; Program Evaluation; Projects; Research; Test Results; Visual Perception

ABSTRACT

The objectives and major questions to be addressed during this project are as follows: (1) To identify those characteristics of preschool children which relate to later performance in primary school; (2) To review existing standardized and non-standardized tests and other appraisal instruments, which may measure changes occurring in preschool participation; (3) To develop an evaluation design for surveying preschool programs funded by ESEA Titles I and III; (4) To develop an evaluation system which will provide data which relate to individual characteristics and the characteristics of preschool programs. The project contains three parts. Part I includes an extensive literature search of recent research and fugitive literature which pertains to the developmental characteristics and learning capabilities of preschool children. Part II consists of a statement of developmental objectives and a review of evaluation instruments. Part III provides the necessary data for the evaluation of programs funded by ESEA Title I and Title III programs. For the literature search, a group of 10 reviewers with expertise in the areas in which they would be reading were chosen. Findings resulting from data analysis include: (1) Advantaged Anglo children under five years of age perform better on the Rod and Frame Test and the Figure Ground and Form Constancy subtests of the Frosting Developmental Test of Visual Perception than Negro children; and (2) Children as young as three can copy designs with sticks to a measurable degree. (For related documents, see PS 005 445-448.) (Author/CK)

ED 059780

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

LITERATURE SEARCH AND DEVELOPMENT OF AN EVALUATION SYSTEM IN EARLY CHILDHOOD EDUCATION

I. RESEARCHED CHARACTERISTICS OF PRESCHOOL CHILDREN

1

Annie L. Butler
Edward E. Gotts
Nancy L. Quisenberry
Robert P. Thompson

April, 1971

PS 005444

The work herein reported was performed pursuant to contract OEC-0-70-5033-284 with the Office of Education, U.S. Department of Health Education and Welfare through Indiana University.

Contractors undertaking such work under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the work. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

ACKNOWLEDGEMENT

A project of this magnitude requires the expertise of many persons. Without them the monumental task of reviewing and summarizing this vast amount of research could not have been accomplished. We would, therefore, like to acknowledge some of the particular contributions which have been made.

The reviewers who located, read, and abstracted the research were unusual in their dedication to the task and in their understanding of the importance of their cooperative efforts. For their painstaking efforts and long hours spent in searching out and reviewing the research on three- through five-year-old children, we wish to thank Nancy Dirksen, Judy Hemenway, Robert Hunner, Mary Martin, William Murphy, Ray Novaco, Kailas Panda, Anita Stoeppel and Charlene Thorpe.

Much credit is also due to the consultants who helped us struggle with problems of analysis of the data and who were able to provide direction through their thoughtful discussions and abilities to provide suggestions for procedural problems. These consultants were Milton E. Akers, Executive Director, National Association for the Education of Young Children, Ernest Campbell, Chairman, Department of Sociology and Anthropology, Vanderbilt University; Alma David, Professor of Education, University of Miami; Harold Fletcher, Director of Research, Institute of Human Development, Florida State University; Dorothy Haupt, Head, Early Childhood Education, The Merrill-Palmer Institute; and Merle Karnes, Professor of Special Education, University of Illinois.

It would be impossible to exaggerate the contribution of our clerical staff who typed the abstracts and checked many of the references for accuracy and who also did much of the proofreading as well as the typing of bibliography and manuscript. To Martha Berning, Sandra Clark, Pam Lawrence, Deborah Liffick, Susan Papp and Carole Payne we are most appreciative.

Many of the facilities and services of Indiana University have been involved in the project. The services of a large research library were essential to the task. Our job was particularly facilitated by the help given by Eva Kiewitt, the education librarian, in the location and use of materials.

Continued support in terms of use of facilities and encouragement have been given by the administration of the School of Education. We are grateful for their continued interest in the project.

Annie L. Butler
Edward E. Gotts
Nancy L. Quisenberry
Robert P. Thompson

CONTENTS

I. Introduction 1

Statement of the Problem 3
Description of Parts of the Project 5
Introduction to Part I 7

II. Procedures 8

Literature Search 8
Analysis of the Data 10

III. Findings 13

Psychomotor Domain 17
 Summary 68
Cognitive Domain 74
 Summary 256
Affective Domain 267
 Summary 370

IV. Conclusions 377

V. Appendices 385

A. List of Journals Searched 385
B. Abstract Sheet 389
C. Coding Guides 395
D. Categories for Analysis of Data 403
E. Revised Affective Categories 407

INTRODUCTION

The research in recent years in the area of child development and early childhood education has drawn increasing attention to the importance of preschool experiences in relation to the later educational progress of children and has led to wide acceptance that the first four or five years of a child's life are the period of most rapid growth in physical and intellectual characteristics and of greatest susceptibility to environmental influences. The early years also provide the all important basis for later development. Theoretical as well as emperical descriptions of development point up the way that the developments of one period are in part determined by earlier developments which in turn influence later developments. According to the theory of Piaget, the greater the variety of situations to which the child must accommodate his behavioral structures, the more differentiated they become. Consequentely, early exposure to a wide variety of activities involving social and intellectual interactions with children and adults greatly enhances a child's ability to learn. The reverse may also be true. Deprivations are most damaging in their effects in the early years when growth and change are most rapid. It seems that such deprivations can be compensated for only with great difficulty in later years if at all. Some of the seeming irreversibility of easily established progressions may well be due to the fixing by experience of affective behaviors and physiological patterns in both qualitatively and quantitatively different ways that may be non-optimal for the later acquisition of particular cognitive structures, a matter which Piaget also echoes in his emphasis on parallel courses of cognitive and affective development.

Recent attention has focused on the great neglect of the human needs of some of our young children and the large numbers of children who enter school unable to make use of the learning opportunities provided. Investigations have demonstrated that child rearing practices in low socioeconomic families make for incompetence under particular task demands in the larger society. While these parents may be sincerely encouraging outwardly, often their lives do not provide models of the competency behaviors which they wish for their children, and they often do not possess the skills to motivate their children toward the active mastery of behaviors which are necessary for competence in our society. As a result, too many children in the lower socioeconomic strata do not learn to learn; their speech, concepts, experience and drive to achieve are inadequate for learning. These children who enter school at a disadvantage have little opportunity to overcome their initial deficiencies. Therefore, since the traditional school is unprepared for the deficits which these children may present, the children of minority and other disadvantaged groups tend to fall further behind in the development of skills which are critical in making a living and participating fully in modern society. These children have the greatest need for early school experience, for they are most in need of help in developing their ability to live independently and creatively in a modern society.

Recognition of the importance of early childhood education, particularly for the three to five year old has increased greatly in recent years. In 1966 the Education Policies Commission of the National Education Association and the American Association of School Administrators issued a statement recommending that education at public expense be offered to all children beginning at age four not merely to offset disadvantage but because they are ready for a planned educational experience.

The importance of early childhood education for disadvantaged children has been recognized through the provision of Federal aid for preschool programs primarily through ESEA Title I and Title III and Project Head Start. The United States Office of Education designated early childhood education as one of five major priority areas and provided funds to support many varied preschool programs and to support the Educational Resources Information Center on Early Childhood Education and the Coordination Center of the National Laboratory in Early Childhood Education.

Statement of the problem

Early childhood programs have developed rapidly. As a result of these programs many more children aged three through five have had school experience than ever before, particularly disadvantaged children. Much data has been collected showing the characteristics of these children and evaluating their progress in preschool and early school years, but no comprehensive analysis of the data has been made. Most of these data have not been interpreted to show the current thinking of researchers with respect to developmental factors which characterize the preschool child at different age levels, from different social strata and from different ethnic backgrounds. This information is needed as a basis for making management decisions concerning the continuation or possible increase in Federal funds for preschool programs.

Although many evaluative studies have been conducted, a more comprehensive and systematic approach is needed regarding the characteristics of the children enrolled and the programs provided. We need to know the characteristics of programs which make a difference in the child's development and his school progress.

Objectives

The objectives and major questions to be addressed during this project are as follows:

1. To identify those characteristics of preschool children which relate to later performance in primary school.
2. To review existing standardized and non-standardized tests and other appraisal instruments, which may measure changes occurring during preschool participation, in the behavioral characteristics important to success in primary school.
3. To develop an evaluation design for surveying preschool programs funded by ESEA Titles I and III. Such a design would include specifications for sampling, specification of variables to be included in any instrumentation, and recommendations for the development of measures to determine changes in the characteristics of preschool children.
4. To develop an evaluation system which will provide data which will answer the following questions:
    a. Which characteristics of preschool pupils are related to later success in primary school?
    b. What are the characteristics of pupils who participate in programs and services provided by Federal funds?
    c. What are the characteristics of the programs and services being provided to preschool children by Federal funds?
    d. What is the relationship between pupil participation in specific preschool programs and services, the home and

school environment, and pupil development as measured by tests and teacher perceptions of changes in classroom behaviors?

e. What is the relationship between the needs of the pupil, the preschool services and programs available to him, and the programs and services in which he participates?

Description of parts of the project

In order to accomplish the above objectives the project will be divided into three major parts. Part I will include an extensive literature search of recent research and "fugitive literature" which pertains to the developmental characteristics and learning capabilities of preschool children. This review will encompass the educationally-relevant developmental traits which have been studied and described in the cognitive, affective, and psychomotor domains for children from three through five years of age including any research concerned with the effects of educational and social-familial factors on the development of these children. It will carefully delineate the findings in the cognitive, affective, and psychomotor domains and will further delineate the findings regarding characteristics of advantaged and disadvantaged children, the developmental characteristics of children at five years of age and below five years of age, and characteristics which show differences in the development of Anglo and Negro children.

Part II will consist of two sections: Development of a statement of developmental objectives and a review of evaluation instruments which

PS 005444

are available to measure the characteristics of three through five-year-old children. The statement of developmental objectives will be greatly dependent upon the review of the literature performed in Part I. Each objective will be stated in specific behavioral terms and will be representative of each major domain--cognitive, affective and psychomotor. It will represent minimum performance standards which all, or nearly all, children need to attain by approximately five years of age if they are to embark at that point upon a regular elementary school experience. The second section of this report will consist of a detailed review of existing outcome measures for determining these developmental objectives, including a description of each measure, the developmental traits which it measures, and the appropriateness of these existing measures for what they purport to measure with preschool children.

Part III will provide the necessary data for the evaluation of programs funded by ESEA Title I and Title III programs. The kinds of variables, content areas, and behavioral characteristics which must be explored by instrumentation will be identified and a rationale will be presented for including these areas. Data will be included which will support a description of the types of programs and services available, the types of pupils who are participating in preschool programs, the unmet needs of preschool age children, and the outcomes which may or may not result from participation in existing preschool programs. A plan for sampling preschool programs funded by ESEA Titles I and III and a design for conducting an evaluation of preschool programs will be included.

Introduction to Part I: Researched Characteristics of Preschool Children

The remainder of this report will comprise Part I of the total project. It will include a description of the procedures which were used in the literature search, an analysis of the data which were obtained, and a complete bibliography of the research which was abstracted and reviewed.

PROCEDURES

In setting procedures for the literature search and analysis of the data, two major aspects of the project were considered: the limited time which was allowed for the completion of the project and the extensiveness of the literature search which was desired. Since the analysis of data and completion of other parts of the total project could not be begun until the literature search was completed, the utmost efficiency was sought.

Literature search

In order to include in the literature search the largest possible volume of research and fugitive literature a group of ten reviewers with expertise in the areas in which they would be reading were chosen. The reviewers were all graduate students who had completed one or more years of graduate study. Three were from psychology, two from early childhood education, and one each from special education, nursing, international education, sociology, and educational psychology. The work of these reviewers was sequenced into three phases: Phase A, search and list references; Phase B, abstract and code; and Phase C, completion of abstracting and coding.

Orientation

Immediately preceding the start of Phase A in the literature search, a meeting of all project personnel was held. The first part of the meeting was devoted to an overview of the intent and purpose of the project and the relationship of the reviewers to it. This part of the meeting consisted of a detailed description of the job of the reviewers complete with a detailed explanation of the procedures which they were to follow and examples of the materials which they were expected to use. Written handouts were provided for later study. Specific helps were provided by the librarian on the use of reference materials, the location of materials, and services which were available to them.

Phase A

Each reviewer was assigned a set of selected journals and other reference materials (Appendix A) to search for research reports relevant to the characteristics of three through five-year-old children or their progress in educational programs. The reviewer listed all bibliographic references on an abstract sheet (Appendix B), keeping those which were in his assigned area and returning all other abstracts to the office for redistribution to other reviewers. During this phase reviewers indicated any fugitive literature or reports of projects which were discovered and which were thought to be particularly significant for the project. Written requests were made for this material. A DATRIX search was made of dissertations as well as a computer search of ERIC materials.

Phase B

At the end of the time allowed, the search for materials was terminated although it would have been possible to continue this phase much longer. Periodic meetings were held with the reviewers as they began the abstracting process to clarify the procedures and discuss problems which arose.

Since each reviewer had many more references than he could read, he was asked to assign priorities to his references by dividing them into three groups: high priority research that must be read; references thought to be good because of author, title or source but not top priority; and questionable references. He was to read those which he thought were the most significant first. As the review process progressed, individual conferences were held with each reviewer to discuss his progress and guide his work. Lists of authors were made by each reviewer and these were checked against the references of other reviewers to eliminate as much duplication as possible.

Phase C

During the last two weeks of the abstracting period the reviewers were asked to abstract all fugitive literature which had been received; to again give priority assignment to those references which they had remaining; and were also told to read studies which were readily available rather than spending time trying to locate more obscure references. After each study had been read it was coded on an IBM optical scan form DS 2970. Duplicate copies of the abstracts were prepared and coding forms were submitted to the optical scanner for punching.

Analysis of the data

Since each abstract was punched on an individual IBM card, the organization of data was very flexible. A special purpose program was written to read, organize, and list components of the abstract system. A component is defined as a minimal categorical unit. The component lists were organized as follows

Component list (1): Demographic breakdown across overall behavioral characteristics

The abstracts were first sorted into three domains of behavioral characteristics--cognitive, affective and psychomotor--as described below in components list (2). Each domain was then sorted into advantaged, disadvantaged or undesignated as to socioeconomic status (SES). Each of these three categories was sorted by age: three year old, four year old, five year old, and mixed. Finally, each of the age categories was sorted by racial-ethnic background: Anglo, Negro, Spanish surname and mixed ethnic background. The computer output listed the component unit heading and all abstract numbers pertaining to that heading. An example of the component unit heading would be: Advantaged, Five Year Old, Anglo.

Before writing, the actual final list of demographic categories was simplified in line with our early frequency analysis to reflect the availability of studies dealing with particular demographic subgroups. The scarcity of studies differentiating three and four year olds led to grouping these in the report as under-fives. On similar grounds, Spanish surname and children of mixed or other (e.g., Japanese) ethnicity were collapsed into one category. This information was not lost, however, because it is still reported in the text, albeit within a more encompassing listing. Thus, the final system of demographic categories reflects: SES (unchanged from above); age, under-fives, fives, and mixed or undesignated; and ethnicity, Anglo, Negro and Mixed or Undesignated or Other.

Component list (2): Detailed behavioral characteristics studied

All studies were next sorted into cognitive, affective and psychomotor, with each domain listing further broken down into its own various coded subheadings of particular behavioral characteristics (Appendix C). A computer output listing provided this list with appropriate headings and subheadings printed and the associated abstract numbers listed under their headings. Also within this list was a shorter additional list of non-behavioral, physical status characteristics, mainly from the pediatrics literature. These were merged with psychomotor in the report.

The actual lists used in writing the major sections of the present report are a combination of components lists (1) and (2), with the complete sublist for cognitive (list 2), for example, being repeated under each of the demographic subheadings (list 1), but now containing under each demographic group only the abstract numbers of those studies which deal with that particular group of children.

FINDINGS

The research summarized in this section is drawn almost entirely from the abstracts prepared by the reviewers during the time allotted to this particular phase of the study. Because of the tight time schedule under which the study was conducted, there was no opportunity to determine gaps and fill in missing areas. The large majority of the studies included are drawn from recognized professional journals or from the ERIC materials. Many dissertations and a sizeable number of unpublished reports obtained directly from authors are also included in the summary. Although no tabulation has been made of the type of material included, an observation of the authors is that some major research, published in book form, has been missed and that the sampling of the research which has been summarized appears to be approximately one-third of that available, based on the number of references discovered by our reviewers, although the more important studies have been included. Years included in the literature search were almost exclusively from 1960 to 1970, although it appears that the years between 1965 and 1970 were better represented in the study than the years from 1960 to 1965, partly in the interest of giving the best coverage of disadvantaged children.

This is a non-critical summary in which the findings have been reported but not evaluated in terms of the significance of the research or the validity of the research methods. The selection procedures did, however, operate to preclude inclusion of highly questionable studies. If the research results were reported as statistically significant, they have been included. Unsupported or undocumented trends have been eliminated. On the basis of this criterion and in the interest of readability, reference to statistics, inferences, hypothesis testing and significance levels has largely been eliminated.

Many behavioral findings are reported which are not necessarily endorsed by the authors as germane, since it was recognized that at a preliminary stage of summarization, it might not be possible to anticipate the importance which some seemingly irrelevant aspect of behavior might assume when viewed in the light of the aggregated studies. Studies may be cited in multiple locations if they deal with either multiple behavioral or demographic features.

Major synthesis of the research is judged to be a proper activity for Part II of the project, with its emphasis on behavioral objectives. Thus, the restriction in Part I has been to those intermediate level syntheses which can be made with regard to age, advantagement-disadvantagement, and ethnic variations, all with reference to the final demographic category description given earlier.

Certain abbreviations of frequently used words have been used consistently throughout the summary: _MA_--mental age, _CA_--chronological age, and _IQ_--intelligence quotient. _ADV_ and _DADV_ have been used for advantaged and disadvantaged and _SES_ has been used for socioeconomic status preceded by the appropriate letter, such as _M_ for middle. Other abbreviations which have been used, particularly in the cognitive domain, are as follows:

AAAS	American Association for the Advancement of Science
B-G	Bender Gestalt
CAT	California Achievement Test
CEFT	Children's Embedded Figure Test
CPI	Caldwell Preschool Inventory
GPRA	Gates Primary Reading Achievement
GPRT	Gates Primary Reading Test

HCT	Hierarchial Categories Test
ITPA	Illinois Test of Psycholinguistic Abilities
MAT	Metropolitan Achievement Test
MLCT	Monroe Language Classification Test
M-P	Merrill-Palmer
MRRT	Metropolitan Reading Readiness Test
PPVT	Peabody Picture Vocabulary Test
RFT	Rod and Frame Test
RPT	Reading Prognosis Test
S-B	Stanford-Binet
SRE	School Readiness Evaluation
WISC	Wechsler Intelligence Scale for Children
WPPSI	Wechsler Preschool and Primary Scale of Intelligence
WRAT	Wide Range Achievement Test

Summaries for studies in each of the three domains--psychomotor, cognitive and affective--are arranged in the same order (Appendix D) to show findings with regard to age, advantagement-disadvantagement, and ethnicity. Within the psychomotor domain the category system is the same as in the code guides (Appendix C). Studies of the medical aspects of development have been included under "Growth and Maturation," although some do not properly fit there. Summaries in the cognitive domain also follow the order given in the coding guides except for two order changes which seemed to make for greater clarity. Within the affective domain the original category system that was used by the reviewers insured that virtually all of the affective studies were properly flagged for later retrieval, but an expanded category system (Appendix E) was necessary to provide a coherent organization to the child characteristics studied. When additional abbreviations are required in the affective domain, they are included in parentheses following the first full mention of the term for which they stand. Advantagement-disadvantagement, age, and ethnicity are summarized at the end of each domain.

Psychomotor Domain

Advantaged Anglo children under five years of age

Balance, movement and coordination.--ADV nursery school children enrolled in an experimental program to provide instruction in body orientation perform better on the Rod and Frame Test and the Figure Ground and Form Constancy subtests of the Frostig Developmental Test of Visual Perception than Negro children. The Anglo children also make higher scores on the Position in Space and Spatial Relationships subtest of the Frostig Test than Negro children (Gill, Herdtner, and Lough, 1968).

Perceptual-motor abilities.--Children as young as three can copy designs with sticks to a measurable degree, with variance in ability being primarily a function of developmental age. Private nursery school children are superior to Head Start children in stick copying abilities (Wise, 1968). Threes to fives are clearly better able to engage in pantomime activities to real objects than to their pictorial representations with significant differences between each age. Age differences in the ability to act pantomimically to photographs also obtain between successive ages but there are no differences between the levels of ability in responding to contextual versus the non-contextual photos. The lag between levels of ability in responding to real objects and to photographs of them is about two years at ages below five (Klapper and Birch, 1969). Perceptual responses are affected by conditions attendant to the task. Nursery school children with a relatively high level of growth seek rich stimulation situations, as represented by complex versus simple pictures, compared to children of a relatively low level of growth (Hicks and Dockstader, 1968).

Visual discrimination of fours and fives on the UCLA Visual Discrimination Inventory is not significantly different (Stern and Lombard, 1968). Nursery School children do not differ in the motor skills of eye-hand coordination, visual perception of figure-ground, perception in space, and auditory perception after seven months participation in a Montessori School, a conventional day nursery and no nursery school experience (Prendergast, 1968).

Speech.--Fours show fewer changes in speech under conditions of delayed auditory feedback than older children. Many of these children are unaware of the temporal aspect of deferred auditory feedback (Chase and Others, 1961).

Advantaged Negro children under five years of age

Balance, movement and coordination.--Negro ADV nursery school children enrolled in an experimental program to provide instruction in body orientation perform poorer in Position in Space and Spatial Relationships subtests of the Frostig Test than Anglo children; but on the basis of total data obtained by the Frostig Test, Modified Rod and Frame Test and Metropolitan Achievement Test few differences are attributed to race (Gill, Herdtner, and Lough, 1968).

Perceptual-motor abilities.--Major changes occur with Negro children between the ages of three and four on the UCLA Visual Discrimination Inventory with MSES groups showing gradual growth from the third to the fifth year (Stern and Lombard, 1968). Negro MSES children are superior on the Wepman and Frostig tests at age four but only average at age six

(Stern, 1966).

Advantaged children under five years of age with unidentified or mixed ethnic background

Growth and maturation.--Diets of MSES nursery school children meet or exceed the 1958 recommended allowances by the National Research Council in calories, protein, iron, vitamin A, thiamin, riboflavin, and ascorbic acid. When compared to the 1964 allowances, calcium may be added to the group. There is a questionable shortage of niacin according to both standards. Ninety percent of the children consume diets containing more than 75 percent of the allowances for calories, protein, calcium, iron, vitamin A, thiamin, riboflavin, and ascorbic acid. However, a substantial number of the children had diets which fell between 50-74 percent of the recommended requirement for iron and niacin and below 50 percent of the recommended requirement for ascorbic acid. Fat composed 34-39 percent of the calorie intake (Dierks and Morse, 1965).

Advantaged Anglo five-year-old children

Balance, movement and coordination.--Kindergarten children who were given a Delacato training program consisting of cross-pattern creeping, cross-pattern walking and Delacato sleep pattern for 18 weeks were compared with controls who had games and play activities for an equivalent time. The test children made significant gains on the Frostig Test but not on the PPVT or the Lee-Clark Test (Stone and Pielstick, 1969).

Dominance, handedness and laterality.--Fives have not established foot-dominance, hand-dominance, eye-dominance or left-right awareness of their own body parts. Hand-dominance is established by age nine; eye-dominance by age ten; eye-hand interrelationships by age ten; foot-dominance by age six; accuracy of left-right awareness of their own body parts by age seven; and accuracy of left-right awareness of another person by age seven (Belmont and Birch, 1963).

Perceptual-motor abilities.--Performance of fives on the UCLA Visual Discrimination Inventory is not different from that of fours (Stern and Lombard, 1968). The five year old is different in his ability to act pantomimically to pictures from the four year old or the six year old. His ability to respond to pictures as opposed to responding to real objects lags about two years, decreasing after the fifth year and disappearing from seven years up (Klapper and Birch, 1969). Kindergarten subjects who have been tested on the Harris Draw-A-Man Test do not increase their scores after being asked to improve upon their drawings or after presentation of visual cues (Kirschner, 1969). Oculo-motor skills are not significantly correlated to scores on the Metropolitan Readiness and Metropolitan Achievement tests although different oculo-motor tasks are significantly correlated (Efron, 1965). High potential kindergarten children are identifiable with the Bender-Gestalt test; however, kindergarten scores on the Bender are not predictive of later school achievement (Keogh and Smith, 1969). Scores on the Lincoln-Oseretsky motor scale are related to Piaget measures in kindergarten but not in first grade. However, teachers' grades at later ages relate to the Lincoln measures, to Piaget measures and to scores on the WISC (Dudek and Others, 1969).

Speech.--Fives decrease their word rate by more than half and increase the percentage of prolonged syllables, repeated words, and repeated syllables under conditions of delayed auditory feedback. Children, aged seven to nine, speak more rapidly under control conditions, but under delayed conditions there are no differences in rate between the under sixes and the older children (Chase and Others, 1961).

Vitality.--Younger kindergarten children are more likely to show hyperkinetic behavior than older children in the group. Hyperkinetic behavior occurs more often in boys than in girls but it is not related to social class. Hyperkinetic children have a greater number of absences and perform less well on readiness tests (Lindy, 1967).

Advantaged Negro five-year-old children

No studies.

Advantaged five-year-old children with unidentified or mixed ethnic background

Perceptual-motor abilities.--Fives' scores on the Bender-Gestalt test correlate more highly with reading readiness scores than with achievement in beginning reading. These scores may be indicative of the visual motor function crucial to beginning reading rather than predictors of accomplished reading performance (Smith and Keogh, 1962).

Speech.--In an experimental speech program, HSES kindergarten children improved the number of perfect articulation and discrimination scores from 28 percent to 71 percent, but improvement was not as much for LSES and MSES groups who doubled their percentage of perfect scores

(Byrne, 1962).

Advantaged Anglo children, mixed ages

Perceptual-motor abilities.--MSES children, aged three through eight, perform consistently faster than LSES children in putting six pegs in a pegboard with both preferred and non-preferred hand. They are not different from the LSES children in the time required to place fifteen toothpicks into a styrofoam ball, string ten beads, or tap sixty times on a laboratory blood cell counter (Schulman and Others, 1969). A sizeable percentage of nursery school and kindergarten children cannot draw a correct form of a cycloid under any of three conditions: visual information alone, both visual and kinesthetic information and kinesthetic information alone. Nearly 100 percent of the children in grades one through five are able to reproduce the form of the cycloid in all three conditions. Fewer incorrect cycloids are drawn in the visual-kinesthetic and kinesthetic conditions than in the visual condition. Correct reproduction of the form is accomplished earlier than correct reproduction of rotation. These children also perform poorer in reproducing the form of the spiral in both the visual and visual-kinesthetic conditions than first grade children, nearly 100 percent of whom correctly reproduce the form. Performance in the kinesthetic condition is poorer at all grade levels, decreasing from 80-90 percent incorrect in nursery school children to 25 percent incorrect in fifth graders (Lurcat and Kostin, 1970). Fours and fives perform fewer than chance alternations in making "T" outlines when a new stimulus is provided on each trial (Ellis and Arnult, 1965).

Children between the ages of three and eleven cannot correctly identify the letter "b" traced on the forehead and on the occiput. There is an increase in the identification of the posterior locus and forward orientation and a decrease in the anterior locus and backward orientation (Podell, 1966).

Auditory perception abilities increase with age between five and eight years. Recognition abilities (listening to an inaudible tape) improve with the use of pictures and with an increase in percentage of time the tape is on (Impellizzeri, 1967; Stern, 1966). MSES children have an advantage in auditory discrimination making improvement between chronological ages four and six which day care center children do not make (Stern, 1966).

Advantaged Negro children, mixed ages

No studies.

Advantaged children with unidentified or mixed ethnic background, mixed ages

Growth and maturation.--MSES children, aged three and one-half to five and one-half, exceed LSES children in height, waist circumference, and muscularity but not in skin-fold thickness (Crispin and Others, 1968). Their mean calorie intake is slightly lower than the recommended allowance, and iron, calcium, and ascorbic acid are among the least well supplied although excretions of vitamins, creatinine values and urinary nitrogen level all suggest a superior nutritional status to the LSES group (Kerrey and Others, 1968; Owen and Others, 1969). Egyptian children do not show the influence of socioeconomic conditions in their serum protein levels but do show a sex difference in favor of boys, thought to be caused by their preferential treatment in the intact family (Hanafly and Others, 1967). Japanese preschool children more commonly have food problems than American children. They are more commonly given sweets for a snack whereas American children are given milk and a raw vegetable. Food dislikes are common in children of both countries but in general American children like more foods. There is a marked difference in favor of the American children in milk consumption (Muto, Muzuno, and Kobayashi, 1969).

Sixty-five percent of children aged three years eleven months to five years four months have no malocclusion. In the 35 percent who have malocclusion there is no relationship between malocclusion and socioeconomic level but there is a significant relationship between habits such as thumbsucking and nailbiting and socioeconomic level, with occurrence of these habits significantly related to malocclusion (Calisti, Cohen, and Fales, 1960).

Perceptual-motor abilities.--ADV kindergarten children score higher on form perception, perception motor match, body image, and differentiation than LSES children (Lietz, 1969). They do not score higher on the Motoric Inhibitions Test and therefore are no more able to inhibit their motor responses on verbal request (Mumbauer, 1969). Accuracy and speed of motor performance increases with age. MSES children tend to perform tasks such as the grooved pegboard test more carefully and less rapidly than LSES children (Knights and Moule, 1968). At each grade level from kindergarten through grade eight, children show differences in increased clarity and sophistication of representation of three dimensional objects on two dimensional space. They also show preference for clarity with increased age level. At all levels preference is on a level of clarity higher than their own drawing skill (Lewis, 1963).

Threes, fours and fives in the San Fransisco Bay area were given the standard Illiterate E vision test by their parents in the home with a percentage of failures which exceeded the statistics of the National Society for the Prevention of Blindness but which were confirmed by ophthalmological examination (Weisenheimer, 1967).

Play.--Underachievers in third grade were children who during the year prior to kindergarten spent the most time outdoors in winter, spent the largest amount of time with the mother in outdoor activities, and spent the largest amount of time with the father in outdoor activities. No differences were found in the kinds of outdoor activities (Wells, 1970).

Vitality.--Younger girls in a two- to six-year-old group of day care children tend to show fatigue in teacher non-guided participation situations in the afternoon and on Mondays. There are no differences in the fatigue scores of the older boys and older girls (Schuckert and Touchton, 1968).

Disadvantaged Anglo children under five years of age

Growth and maturation.--Compared to a "normal" population DADV Anglo children are shorter in height, lower in weight and have a smaller head circumference. Compared to Negro children, Anglo children have higher red blood cell volumes and higher mean skin volumes. Anglo females are the shortest and fattest and Anglo males have larger head sizes than Anglo and Negro females (Stine, Saratsiotis, and Furno, 1967). But agreement is not complete; one institutionalized population of under fives has normal height and below normal weight at all IQ levels. Head and chest circumference is also within normal limits (Mosier, Grossman, and Dingman, 1965).

Perceptual-motor abilities.--Head Start children are poorer than private nursery school children in stick-design copying. Errors show a linear decrease with increasing age after three years (Wise, 1968). Children with a relatively low level of growth avoid rich stimulation situations. They choose simple pictures in preference to complex and novel stimuli (Hicks and Dockstader, 1968).

Disadvantaged Negro children under five years of age

Balance, movement and coordination.--Children of LSES disorganized families are sure-footed and quick with good rhythm but they show a lack of motoric caution. Often they use their bodies for diffuse discharge and avoidance, with little focus on the pleasures of attaining mastery. After nursery school experience improvements are noticeable in enjoyment and skill of body use and gross motor control becomes functionally excellent. Abuse of their bodies is reduced to a minimum and there is a shift from diffuse tension discharge, primarily motoric, to a more focused mode of reaction to stress, which includes verbalizations. Hyperalertness does not cease (Pavenstedt and Others, 1967).

Dominance, handedness and laterality.--Under fives who have left-hand-left-eye dominance perform more poorly than all other hand-eye dominance groups on perceptual-motor measures which involve copying forms such as a circle, cross or square and the diamond or cross of the Porteus Mazes (Flick, 1966). Under fives are also poorer in left-right differentiation than children older than five and one-half (Ozer and Milgram, no date).

Perceptual-motor abilities.--Four and one-half year olds are poorer at copying letters of the alphabet and Arabic numerals than five year olds. The ability to correctly match letters of the alphabet and Arabic numerals is very low both before and after attending the Head Start program (Ozer and Milgram, no date). LSES Negro children make meager gains on the UCLA Visual Discrimination Inventory so that at the fifth year they are not superior to the average three-year-old Anglo child (Stern and Lombard, 1968).

Growth and maturation.--Children of LSES disorganized families are generally well-built and present a sturdy appearance (Pavenstedt and Others, 1967). As compared to the "normal" population, LSES Negro children are shorter in height and lower in weight with a smaller head circumference. Twenty percent have red blood cell volumes below normal. LSES Negro children are taller than LSES Anglos, with Negro boys being the tallest, heaviest, leanest, and most anemic (Stine, Saratsiotis, and Furno, 1967).

Play.--Prior to nursery school experience, children of disorganized families do not know how to play but after school experiences they begin to enjoy play and develop the capacity to become involved (Pavenstedt and Others, 1967).

Disadvantaged children under five with unidentified or mixed ethnic background

Construction with manipulables.--Learning of manipulation skills is influenced by the kind of instruction the child is given. Under fives given only verbal instruction on how to assemble form boards and puzzles regress while children given practice and practice and verbalization treatments make gains. Practice and verbalization is not significantly better than practice (Lombard and Stern, 1970). Head Start children are able to produce a scorable response on the "make a felt person" test; but only 70 percent are able to make a scorable response on the Draw-A-Person Test, and only 42 percent can copy the picture of the person they have made of felt (Clos and Serafica, 1967).

Dominance, handedness and laterality.--During the fourth year children start to demonstrate an eye preference which is consistent as the child is tested and retested. There is some change in laterality between three and four years. Most threes use both hands interchangeably in play while most fours use one hand more than the other (Savitz, Reed, and Valadian, 1964).

Growth and maturation.--Physical examinations reveal that physical problems are frequent. In one group of 842 children physicians found 66 children with severe medical problems: 1.3 percent had definite neurological findings; strabismus was found in 2.4 percent; 3.8 percent had convulsions; 57 percent still wet the bed; 10.7 percent wet themselves during the day; 40 percent stuttered or stammered; and 25.3 percent were thumbsuckers. Only 35 percent of the children were free of habits that indicated symptoms of emotional tension (Stine, Saratsiotis, and Furno, 1969). Other commonly discovered problems are low hemoglobin, visual defects, and need for dental care (Sherman and Doyle, 1967). Those children who are in the extremes of physical measures such as height, weight and hemocrit have a greater likelihood of having characteristics that place them in the extremes of other measures. Those in the lowest 10th percentile of the hemocrit have twice the expected representation in the group of children below the 10th percentile on the Columbia Mental Maturity Test. Those above the 90th percentile in head circumference have an increased frequency of neurological defect (Stine, Saratsiotis, and Furno, 1969).

Vitamin A and B complex deficiency signs increase with age between one and five years; however, vitamin deficiencies are prevalent in children in different growth categories of height, weight and height-weight ratio. These deficiencies do not seem to interfere with the growth performance of children to the same extent as protein and calorie malnutrition (Madhaven, Sushella, and Suaminathan, 1967). Supplementing the diet with lysine supplemented wheat results in an increase in height but not an increase in weight, hemoglobin, packed cell volume, total serum proteins, or serum albumin (Pereira and Others, 1969).

Perceptual-motor abilities.--Problems are involved in the measurement of perceptual motor abilities of LSES children under five. In a test of visual attention span for objects, 88 percent of fours failed to reach the minimum score which is the basis for a mental age of two years. At the end of the Head Start program this percentage was reduced to 54. Motor speed and visual attention span are areas of considerable developmental deficit. The high and middle IQ samples improve in motor speed but the low IQ group continues to perform below a mental age of three years (Cawley, 1966). In another group tested for visual acuity 10 percent of the children did not speak at all and 57 percent of the testable children did not speak well for their age. The ability to name pictures appears to increase with age, but it overlaps with abilities like indicating directions. In indicating directions the abilities of three year olds are limited but testability increases markedly after 42 months (Savitz, Reed, and Valadian, 1964). Difficulties are also incurred in drawing and copying and in describing the roundness, pointedness or squareness of an object. Threes and fours make many errors on tasks requiring these abilities (Clos and Serafica, 1967, studies I and II).

Speech.--Imitative responses in the repetition of English and Russian words are found to be dependent upon at least partial reinforcement in children under five. These imitative skills are regarded as important in the process of vocabulary elaboration (Brigham, 1967). Practice with auditory stimuli which requires discrimination between the correct and incorrect responses does not help under fives with articulatory problems to correct their inability to correctly pronounce stimulus words (Brigham, 1967).

Disadvantaged Anglo five-year-old children

Balance, movement and coordination.--Fives who have been given diagnostically based motor development lessons and an organized program of physical education do not show gross motor proficiency which is different from children who have been enrolled in a regular kindergarten program or who have had no school experience (Lillie, 1966). Ability to inhibit motor activity is positively related to IQ while the ability to speed up is not related (Massari, Hayweiser, and Meyer, 1969). Anglo fives are less skillful at tasks demanding physical coordination than Negro fives (Kohlewes, 1966).

Perceptual-motor abilities.--Fives, selected because they can sort triangular and circular cards and can trace two circles and triangles but cannot draw circles and triangles freehand, improve in their abilities to draw after discrimination training which involves "pointing" to the correct figure and regress when the discrimination training involves "tracing" the correct figure. The child cannot draw what he cannot discriminate, but he may not draw what he can perceive. Some of the lag between perceiving and performing may be due to inadequate discrimination but some is apparently due to the child's inability or unwillingness to translate what he has discriminated into his copying behavior (Bee and Walker, 1968).

Anglo fives are less skillful at tasks demanding sensory perception than Negro fives (Kohlewes, 1967). Formal instruction involving diagnostically based motor development lessons results in increased fine motor proficiency higher than that gained from a regular kindergarten program which in turn results in greater fine motor proficiency than no school experience (Lillie, 1966).

Disadvantaged Negro five-year-old children

Balance, movement and coordination.--Negro DADV fives are more skillful than DADV Anglo fives at tasks demanding coordination (Kohlewes, 1966).

Perceptual-motor abilities.--Negro Head Start fives are characterized by a comprehensive developmental lag when they enter first grade. Five measures of visual-perceptual development have an average lag of about eight months and approximate the child's MA. Visual motor association is one of two areas in which performance approximates CA (Cawley, Burrow, and Goldstein, 1968). A similar relationship exists between MA and matching and copying abilities. Older children in a Head Start program are more skillful at copying letters and Arabic numerals than younger children, but scores are very low and neither group improves significantly as a result of the program. Ability for matching letters and Arabic numerals does improve but improvement of scores is more related to the MA than to program, sex, age level, or practice (Ozer and Milgram, no date).

Speech.--Stutterers get greater scores on repression-denial and symbolization than adaptive non-stutterers but there are no differences between stutterers and maladaptive non-stutterers on these characteristics (Porterfield, 1969).

Disadvantaged five-year-old children with unidentified or mixed ethnic background

Balance, movement and coordination.--Fives who receive Kephart-type training make higher motor abilities scores on Gesell Developmental Schedules than the controls (Edgar and Others, 1969).

Dominance, handedness and laterality.--Eye-hand confusion problems are found to exist among 50 percent of a group of Anglo and Mexican Head Start children regardless of ethnic group. Mexicans make greater gains in laterality and directional training, according to teachers (Johnson, 1965).

Growth and maturation.--Incidence of physical health problems among Head Start children is very high. In Boston 77 percent were referred for one or more conditions, pediatric, dental or mental health. Seven percent had findings in all three areas. Twenty-nine percent had findings in a single area (Mico, 1966). In a Tennessee county, 84 percent had teeth defects and 12 percent had general medical problems. Six percent of these children were found to have vision defects and one-half of one percent had hearing defects (Larue, 1970).

Perceptual-motor abilities.--Deficits in perceptual-motor functioning of about one year are found in DADV fives (Johnson, 1965). Some training programs tend to help in overcoming these deficits. Psycho-socially deprived children enrolled in a diagnostically based and kindergarten control program made gains in fine motor skills above a home control group (Hodges, Spicker, and McCandless, 1967). Children enrolled in programs labeled as direct-verbal, Ameliorative, Montessori, and community integrated made gains in visual perception although children enrolled in a traditional kindergarten program did not make progress in this area (Karnes, Hodgins, and Teska, 1969).

The effects of training programs are not predictable, however. Frostig training produced gains on only one subtest, Position in Space, and made no difference in IQ (Beck and Talkington, 1970). Training on psychomotor functioning using subtests of the Stanford-Binet such as folding a triangle or copying a square increased psychomotor scores but did not change the IQ (Jones, Terrell, and DeShield, 1967). Five year olds using a programmed text have no difficulty discerning the roundness, pointedness, or squareness of an object (Clos and Serafica, 1967, Study II).

Self-care activities.--DADV children do not show increased abilities in manipulative self-help skills as a result of school experience (Vance, 1968).

Disadvantaged Anglo children, mixed ages

Growth and maturation.--Twenty-nine percent of Anglo children in a Head Start sample were hospitalized during the period of one year. Illnesses accounted for 21 percent of the hospital admissions (Stone and Kudla, 1967).

Perceptual-motor abilities.--DADV Anglo children perform better than DADV Negro children on the Frostig Test on two subtests, Position in Space and Spatial Relationships. After special training in body orientation exercises children performed better on the Rod and Frame Test and on Frostig subtests, Figure-Ground and Form Constancy (Gill, Herdtner, and Lough, 1968).

LSES children ages three through eight perform consistently poorer in speed of putting six pegs in a pegboard with both preferred and nonpreferred hand. They are not different from ADV children in the time required to place fifteen toothpicks into a styrofoam ball, string ten beads, or tap sixty times on a laboratory blood cell counter (Schulman and Others, 1969).

Disadvantaged Negro children, mixed ages

Growth and maturation.--In one group of 223 DADV Negro children who were given physical examinations, 20 had eye defects, 13 had hemotologic diseases, 8 had nose and throat diseases and 7 had gastro-intestinal diseases (Scott and Kessler, 1968). In a sample of Head Start children 8 percent of the Negro subjects were hospitalized during the year. Illness accounted for only 4 percent of the hospital admissions (Stone and Kudla, 1967).

Perceptual-motor abilities.--Negro children do not improve over age between four and six years on auditory discrimination on the Wepman Test as Anglo children do. On visual discrimination as measured by the Frostig Test, scores are in the lowest 25 percent (Stern, 1966). Negro children perform more poorly than Anglo children on the Frostig Test on subtests of Position in Space and Spatial Relationships. When training in body orientation exercise was provided, gains were made on the Rod and Frame Test and on the Figure-Ground and Form Constancy subtests of the Frostig (Gill, Herdtner, and Lough, 1968).

Disadvantaged children with unidentified or mixed ethnic background, mixed ages

Growth and maturation.--Health problems, many of them major and many not under care, are common among Head Start children. Some of the most frequently identified are dental diseases, diseases of the nervous system, asthma and other allergic conditions, nutritional diseases, respiratory diseases, skin infections, enuresis, hernias, speech abnormalities, vision and hearing losses (Gilbert, Lewis, and Day, 1967; Stone and Kudla, 1967; Kravitz, 1966; Brewster, 1968). Physical problems are often found in conjunction with personality problems, neurological problems and mental retardation, and deviations in size of the head and in height and weight (Comly and Hadjisky, 1967; Kugel and Parsons, 1967). Changes in hemoglobin levels of children who have begun treatment with hemoglobin levels below 12.0 grams are related to changes in IQ (Munro, 1967). Caloric intake varies between 48 percent and 141 percent of the daily recommended allowance with large percentages of children eating more than 100 percent of required non-enriched carbohydrates and fat (Munro, 1968; Kugel and Parsons, 1967). The greatest source of calories for the LSES group is the bread and cereal group. Iron, calcium, protein, calories, and ascorbic acid are among the nutrients least well supplied (Kerrey and Others, 1968; Owen and Others, 1969). Height and weight show deviations from normal to below average (Kugel and Parsons, 1967; Munro, 1968; Murphy, Guthrie, and Woodruff, 1967; Crispin and Others, 1968; Owen and Others, 1969).

Habits such as thumbsucking and nailbiting are less frequent in LSES groups. Malocclusion is related to the occurrence of these habits but not to socioeconomic level (Calisti, Cohen, and Fales, 1960).

Perceptual-motor abilities.--Inner city children's perceptual performance shows Montessori training is good for poor perceptual achievers and modest for the average or above average perceptual perceivers. Effects of training are more pronounced with younger children and differences were much more salient at the end of the second year of training than at the end of the first year of schooling (Berger, 1969).

LSES children tend to perform such tasks as the Maze test, graduated holes test, and grooved pegboard test with more speed but less accuracy than HSES children (Knights and Moule, 1968). DADV children score lower on the Purdue Perceptual-Motor Survey with greatest differences in form perception and least in body image and differentiation (Lietz, 1969).

They are more impulsive in response disposition than ADV children but are not less able to inhibit their motor responses upon verbal request (Mumbauer, 1969).

Speech.--Articulatory ability tends to increase with age between four and one-half and five and one-half with subjects preferring actual objects to color transparencies and color prints as stimuli, with black and white prints the least preferred stimuli (Irvin, 1967).

Anglo children of undesignated or mixed socioeconomic background, under five years of age

Balance, movement and coordination.--Scores evaluating aspects of physical conditions at one and five minutes after birth are related to scores evaluating gross motor coordination: line walk, hop on right and left foot, and ball catching at four years of age (Edwards, 1968). Using the same measures of gross motor coordination a greater percentage of four-year-old girls than boys delivered through elective induction of labor were found to be normal (Niswander, Toroff, and Romans, 1966). The single best predictor variable of the criterion measures at four was the rating of muscle tone (Edwards, 1968). There are no differences in the accident rate between threes and fours. Most accidents occur while using equipment. Next, in order of frequency, are accidents inflicted by others, falls, bumping into something, and playing in the sand. Most accidents occur in the last hour of the school session except for children who stay for lunch (Bitner and DeLessovoy, 1964).

Dominance, handedness and laterality.--Fours cannot follow testing procedures which involve pointing to one of six colored circles arranged in three rows of two circles each and fail to establish a basal score on the Left-Right Discrimination Test (Boone and Prescott, 1968).

Growth and maturation.--Higher frequencies of health problems are found in fours and in threes than in twos in a population including children up to five years old. Two major causes of health problems are congenital malformations and infections, followed by allergy, nutrition trauma and tumors. Proportionately fewer infections are found during summer months than during the spring. Tumors are more frequently identified in the Anglo children while congenital malformations are more frequent in the non-white children. Fewer health problems occur in the Anglo group--40.2 percent as compared to 45.2 percent (Hartman and Others, 1960).

Perceptual-motor abilities.--Preference of threes and fours for complexity is an increasing linear function of the complexity of the stimuli with no change across trials. This preference seems to be independent of age (Munsinger and Weir, 1967; Strain, 1968). Success in color matching increases with age with the mean number of errors decreasing rapidly from age three to five. Figures such as firetrucks, lemons, and lakes are matched with fewer errors than squares. The most preferred color is blue followed by red, green and yellow (Navrat, 1965). Among threes and fours, ability to correctly identify figures, some a dark figure on a light ground and some a light figure on a dark ground, improves as a function of age, practice, and distinctness of figures but there is no difference between the number of correct responses for dark-on-light versus light-on-dark figures (Johannsen, 1960). Both auditory and visual pretraining facilitate performance in a tactile discrimination task by threes and fours. Visual pretraining is more effective in facilitating performance in the tactile task than is auditory pretraining (Houck, Gardner, and Ruhl, 1965). Body size is inaccurately estimated by threes and fours in terms of reaching for objects that are too high but block builders seldom misjudge the size of block that will fit when the sizes of blocks are grossly different. Visual perceptions of direction and depth can account for nearly all the space perceptions required for safe and successful performance of children's play activities (Smith, 1965). Scores evaluating aspects of physical condition at one and five minutes after birth are related to fine motor skills as measured by the Porteus Maze, Wallin Pegboard, copying forms and stringing beads at age four (Edwards, 1968).

Play.-- Color preference is not of primary importance in the block play of fours. Position does appear as the single most important factor in determining children's use of blocks, with outermost piles chosen more often than inner piles (Gramza and Witt, 1969).

Speech.--Between the ages of two and one-half and four, various types of the "r"--prevocalic, intervocalic, stressed vowel, and unstressed vowel--develop at different rates. With an increase in age, the child's choice of incorrect response and his approximation of the prevocalic "r" develop systematically in the direction of correct production. Paralleling his development toward correct production, the child's articulatory pattern becomes more stable (Murray, 1962).

Negro children of undesignated or mixed socioeconomic background, under five years of age

Growth and maturation.--Analysis of factors affecting anatomic, physical, and psychological growth of Negro children under five reveals that intragroup variations are similar, both in range and in factors relating to the variation, to those long accepted as existing among Anglo children. Socioeconomic status was found to be directly related to most of the measurements of growth and development such as weight, height, head and chest circumference, and nutritional evaluation (Crump and Horton, 1961). Differences in height and weight, however, are very slight among ability groups on the Merrill-Palmer Scale showing little indication of a relationship between these physical characteristics and mental development (Horton and Crump, 1962). Negro threes and fours have more health problems than Anglo children--45.2 percent as compared to 40.2 percent. Congenital malformations are more frequently identified than in Anglo children (Hartman and Others, 1960).

Perceptual-motor abilities.--Bi-dimensional sorting on the basis of form and color is very easy for three and one-half year olds and fours. A quick shift in the development of this ability occurs between two and one-half and three and one-half years (Watson and Leinberry, 1967).

Children of undesignated or mixed socioeconomic background, under five years, mixed background

Balance, movement and coordination.--The first two-footed jumps that involve appreciation of the distance objective and the type of attitudinal preparation which simultaneously project the body forward and upward are made at three. The shoulder girdle is retracted and the arms move backward during the propulsive phase of the jump. At 41 months the arm retraction pattern is full blown. The shoulder girdle appears almost to be elevated. Dorsiflexion of the head during the early stages of flight is extreme. No lower extremities extend nearly to the full on the take-off. The upper extremities extend to a position virtually parallel to the floor. The direction of arm movement is opposite to the line of flight and must slow up forward progression. At forty-three months, the child is on the threshold of the execution of a mature type of jump for distance. The first overt manifestation of this, the suppression of the retracted arm position which had seemed to be a purely reflex maneuver, was not a complete success. The first attempt to swing the arms forward in synchrony with the propulsive thrust of the legs disturbed the balance and the subject landed on all fours (Hellenbrandt and Others, 1961).

Threes and fours show marked differences in their frequency of accidents. In free play boys have twice as many accidents but in controlled situations there are no sex differences. Some children are repeaters, a characteristic which is predictable by teachers and is associated with such traits as obstinacy, over-activity, robustness, and impulsiveness. It is not equipment per se but the way it is used by the child that is most significant in contributing to the frequency of accidents (Federer and Dawe, 1964). Retardation in the development of motor skills appears to be strongly influenced by restriction of specific learning opportunities. Institutionalized threes who had been left on their backs until they spontaneously achieved a sitting position were severely retarded in motor skills development whereas children propped up, encouraged and provided with toys were only slightly retarded (Dennis, 1960). Fours, with identified weakness in gross motor abilities, are helped more than children in control groups by a program designed specifically to help overcome weakness (Coffman and Dunlap, 1968). Stimulation of the affected hand of cerebral palsied children, while the child listened to a story, resulted in an increase in the growth curve of spontaneous reach and grasp with that hand (Barrett and Jones, 1967).

Growth and maturation.--Based on samples drawn mainly between 1950 and 1960 in Africa, Asia, Australia, Europe, North and South America, the West Indies and the Malay Peninsula, contemporary populations of fours differ as much as seven inches in mean height and thirteen pounds in mean weight (Meredith, 1968; Ashcroft and Others, 1966). At ages three and four weight is related to birth weight and prematurely born show little tendency to overcome their initial weight handicaps. At four the prematurely born are still shorter than the mature controls by between one and one and one-half inches. Increments are approximately equal for boys and girls but decrease with declining maternal standards, the effect being most noticeable in those smallest at birth. At four, differences are found in weight increment between those who had or had not exhibited feeding problems in the previous two years (Drillien, 1961; Harper, Fischer, and Rider, 1959). Obstetrical complications increase the occurrence of neurological signs with 73 percent still abnormal between two and four years as compared with 14 percent among newborns without complications (Prechtl, 1965). There is very little difference in the data for boys and girls under four for the measurements of both the bone and muscle width. Growth shows basically a rapid increase in infancy and a slower, more straight curve in the childhood years. Fat width rises rapidly during infancy with the curves for boys and girls practically superimposable but between the second and fifth years girls lose fat less rapidly than the boys (Maresh, 1966; Tanner and Whitehouse, 1962; Anderson, Messner, and Green, 1964).

Mean food intakes of threes at the noon meal provide one-third or more of the recommended calories and nutrients except for calcium and iron which fall between one-fourth and one-third of the recommendation. For fours, one-half of the daily requirement of iron and over one-third of calories and all other nutrients is obtained (Samenfink, Schuck, and Opheim, 1958). The percentage of total protein derived from animal protein in the diets of threes and fours is approximately 70 percent. Patterns involving extreme shifts from high to low are very rare. Approximately 13 percent of calories are derived from total proteins (Burke and Others, 1962). Mean tap water intakes are consistently less than one-half of the daily fluid volume consumed in threes to fives (Walker, Margolis, and Teate, 1963). Preschool children are found to have fewer likes and to be familiar with fewer foods than parents. All foods unfamiliar to both parents are usually unfamiliar to the child also. Foods disliked by both parents are usually disliked by the child or are unfamiliar to him (Metheny and Others, 1962).

Perceptual-motor abilities.--Large scale vision screening of preschool children with the Snellen E Chart reveals that 5-6 percent are referred for professional examination with the highest referred rates being for threes and fours. Seventy-five percent of those referred for professional examination were found to have some type of abnormal eye condition. Eighty-seven percent had some type of refractive error; 22 percent had a muscle imbalance; 11 percent had amblyopia; and some children had more than one defect (Hatfield, 1967). Other studies show similar abnormal conditions although in different percentages but in each case verifying the need for early visual screening of preschool children (Kaivonen and Koskenoja, 1963; Kittredge and Cunningham, 1965). Testing of some threes is impossible because of rejection of the occluder but acceptance after age 41 months is usually possible (Savitz, Valadian, and Reed, 1965).

On the basis of audiometer tests, 4.8 percent of threes and 5.3 percent of fours are referred to private physicians for further testing. The percentage of hearing loss is comparable to that found in school age children. The percentage of hearing loss in children with an essentially normal throat is 12.5. With diseased conditions the percentage rises: slight disease in nose and throat--32.5 percent; enlarged and infected tonsils and adenoids--45.0 percent; allergic rhinitis--22.5 percent; serous otitis media--17.5 percent; eardrums abnormal--36.3 percent; wax in canals--51.3 percent (Ashley and Seshin, 1962).

Under fives do not differ from their parents in their ability to detect the difference between low dilutions of sucrose and citric acid. Parents are more sensitive in detecting quinine sulfate and mothers are more sensitive in detecting sodium chloride solution, but no evidence supports the view that the tastebuds of threes and fours are more sensitive than those of adults (Feeney, 1965; Feeney, Dodds, and Lowenberg, 1966). A child who is sensitive to one of four taste sensations is also highly sensitive to the others, but taste sensitivity is not related to the percentage of foods liked, the length of time required to eat, or the amount of milk consumed. Acceptance of oatmeal and grapefruit is related to lowest taste sensitivity (Korslund and Eppright, 1967).

In figure drawing, at 46 months children begin to include a mouth more systematically than younger children. Twenty-two percent under 46 months draw a mouth while 75 percent draw a mouth if over 46 months. Once the child is able motorically to manage a pencil to draw an ellipse, he also draws eyes, and only later includes other facial features. Drawing of the nose shows similar changes to those of drawing the mouth. Some children, after questioning about different parts of the face, show a strong sameness in the way they produce what are essentially replicas of their first drawings and label them different people. Threes also are not influenced by a training program of fourteen lessons in tracing patterns in comparison to a group that worked puzzles and played games for an equal time. On a post post-test the experimental group achieved higher scores on the parts of the test that required copying of the training and criterion figures (Kannegieter, 1970). There is a difference between the fours' drawing of a house before and after he sees an adult model draw a stylized house. Their houses become more like the adult drawn model in size and in the use of more horizontal than vertical lines (Urbana and Pease, 1960-1961). Experience in a nursery school classroom which ranks high with regard to supportive discipline has a positive influence on children's drawings as compared to experience in a permissive or punitive classroom (Reichenberg-Hackett, 1964).

In a three-phase training program in which threes and fours were asked to demonstrate ability to match names of letters with their graphic symbols, to type letters from dictation and to demonstrate skill in reading words orally, training sessions on the Edison Responsive Environment non-automated typewriter, audiovisual equipment and Instructo resulted in improved ability in the recognition of upper case and lower case letters. The children could recognize their names but no other words and could type their names but no other words. No differences were found between MSES and LSES children (Steg, Mattleman, and Hammill, 1968). Prior to participating in three of five preschool intervention programs, 96 percent of the fours in the traditional program, 75 percent of the fours in the Ameliorative class, and 91 percent of the fours in the direct verbal class had scores placing them in the lowest quartile on the Frostig Test. After participation in the program, on the post-test the Ameliorative was higher than the other four groups with only 21 percent in the lowest quartile. In direct verbal 43 percent scored in the lowest while 75 percent to 81 percent of children in the other three groups obtained scores in the lowest quartile (Karnes, Hodgins, and Teska, 1969).

Play.--Toys that were selected for use in a training program to help parents teach threes and fours through the use of educational toys were sound cans, color lotto, wooden table blocks, and the flannel board. Toys rejected were feely bag and color cubes. Toys revised were stacking squares, numberite, and Sifo shapes. The toy was selected if during the week the child played with it more than five times, if he played with it at least once without being asked by the parent and if 80 percent were still interested in the toy at the end of the week (Nimnicht, Rayder, and Alward, 1970). Nursery school children's play shows a wide range of sex differences with boys playing with blocks more than girls but no age or sex difference is found in the duration of play (Clark, Wyon, and Richards, 1969). When play with a toy is preceeded by a film, the influence of the film is enhanced if the child has no previous experience with the toy (Madsen, 1968).

Self-help activities.--Some threes and fours are completely unable to wield a toothbrush. The parents are 9 percent more effective than the child at toothbrushing. Scrubbing horizontally is more effective than the roll method for the primary dentition when either the child or the parent brushes the teeth (McClure, 1966). Children who receive 120 ml. of milk at mealtime drink more in terms of amount than children who receive 40 ml. During an experimental period in which a laissez faire attitude was taken, the amount of milk consumed decreased (Holloway, 1960).

Speech.--During a two-semester vocal training program twelve out of thirteen threes learned to sing tunefully from middle C up to A while the remaining child achieved tuneful reproduction from middle C to F. Threes did not respond to training designed to help them learn to sing tunefully in a higher range. Fours responded more quickly than younger children, becoming completely accurate after one semester of training. The older children did improve as a result of upper range (A-D) training but only 7 achieved the level of accuracy displayed in the lower range (Smith, 1961).

The number of articulation errors by cleft palate children decreases as age level increases, but only 6 percent of the cleft palate children three years or older are able to earn articulation error scores at or above the level of three-year-old normal children. The order of difficulty of consonant sounds when grouped by phonetic classification is similar for cleft palate and normal subjects. The cleft palate children differ from the normal children in that medial sounds are more difficult than initial sounds; whereas for controls, the medial and initial sounds are of nearly equal difficulty. Another difference is that substitution errors do not decrease appreciably with chronological age for cleft palate children as they do for the normal children (Philips and Harrison, 1969).

In a special case study of a blind four year old, eight months of treatment resulted in substantial progress in learning, imitating and producing speech meaningfully and spontaneously. Her vocabulary and receptive language increased greatly, as evidenced by ability to respond to simple commands (Wessell, 1967).

Anglo five-year-old children of undesignated or mixed socioeconomic background

Dominance, handedness and laterality.--Beginning with age five, the number of errors on the Left Right Discrimination Test decreases. From five to ten years there appears to be a strong linear trend related to increasing age and decreasing left-right errors. The child must first master a basic left-right discrimination with left-right directions related to self before he can make relativistic discrimination, recognizing the left-right sides of persons and objects before him or in back of him (Boone and Prescott, 1968).

Perceptual-motor abilities.--Success in color tint matching increases with age with red, yellow, blue and green not discriminated with the same relative accuracy at all age levels. Green becomes easier for fives and remains so for older children. Children match figures of most preferred-least preferred colors with fewer errors than squares of the most preferred colors. The most preferred color is blue, followed by red, green and yellow. The number of errors decreases less rapidly after five than between three and five years (Navrat, 1965). Kindergarteners are less spontaneous in their discrimination of mirror-image reversals than first graders. After instruction, first graders discriminate mirror-image reversals with more proficiency than kindergarteners (Cronin, 1967). Speed of fine motor functioning--length of time to put six pegs in a pegboard, seconds required to string ten beads, and seconds required to tap sixty times on a laboratory blood cell counter--improves more slowly after five than before (Schulman and Others, 1969). Fives' control of operant motor responding (tapping response) approximates that of first grade children when the subjects say the verbal operants to themselves aloud, but whispering the operants using only lip movements has minimal functional control over motor behavior. First grade children's self-verbalization has more functional control over motor behavior when covert than overt (Meichenbaum and Goodman, 1969). Mean time on target for fives on a rotary pursuit task is very small with overall proficiency increasing steadily between kindergarten and first grade. Fives and sixes make greater gains with practice than younger children, thus magnifying age differences on later trials. The pursuit rotor is not considered the ideal task to use with young children since it is repetitive, fatiguing, and less interesting than a more complex task might be (Davol, Hastings, and Klein, 1965). Fives trained on a task involving lists of words of high and low similarity in an artificial alphabet resulted in the best performance in the post-training task by the low similarity group and worst performance for the high similarity group. On the transfer task (reading) the low similarity group made a greater number of false identifications than the high similarity group, leading to the conclusion that training that forces the attention to each letter is less likely to lead to reading errors than training which permits the child to identify words on the basis of a single feature (Samuels and Jeffrey, 1966). These results were confirmed by a similar experiment using combinations of actual letters. Letter discrimination training is superior to both relevant shape, relevant letter training and irrelevant shape, relevant letter training (Muehl, 1961).

Anglo fives fall at the 50th percentile on the Frostig Test and get 23.57 out of a possible thirty points on the Wepman with a low rate of variability and no correlation between auditory and visual perceptions. Over a period of five years only 8.7 percent of these children were retained in first grade (Lowry, 1970). In normal fives the median number of developmental deficits is one as measured by the Sapir Developmental scale, whereas among deficient children the median is four (Sapir and Wilson, 1967). The Bender-Gestalt errors of kindergarten children are lower for kindergarten than non-kindergarten children and have a higher negative correlation with PPVT scores than those for the non-kindergarten children (Whipple and Maier, 1966).

Negro five-year-old children of undesignated or mixed socioeconomic background

Perceptual-motor abilities.--Negro fives show considerable overlap on structural organization, visual imagery and visual classification on the Chicago Test of Visual Discrimination. The auditory discrimination test scores on the Wepman Auditory Discrimination Test and Ryckman-Bereiter-Powell Auditory Closure Test were excluded because the test proved too difficult for LSES boys (Ryckman, 1967).

Five-year-old children of undesignated or mixed socioeconomic background, mixed ethnic background

Movement, balance and coordination.--Fives engaged in a training program of gross motor activities for one-half hour daily over an eight-week period made gains on the Perceptual Forms Test and Form A of the Metropolitan Readiness Tests. No differences were found between the children above and below the median chronological age, but scores of experimental subjects above the median MA on the Pintner-Cunningham Primary Test exceeded scores of experimental subjects below the median MA (Lazroe, 1969). Fives are more willing to try a difficult bean bag target game when in pairs than when alone. They are least willing to try when before the class (Torrance, 1969). In jumping, fives move arms forward during the propulsive phase of the jump; however, the arms remain bent and rarely elevated above the shoulder level. As viewed in profile they appear to project at right angles to the torso, parallel to the floor. The upper extremities now function primarily and importantly as equilibrators. They prepare attitudinally for jumping by a deep crouch, marked flexion of the trunk and strong dorsoflexion of the head. Extention of weight bearing limbs is rapid. Use of the arms as stablizers is probably necessary. Head positioning follows a stereotyped pattern once jumping for horizontal distance is accomplished (Hellebrandt and Others, 1961).

Growth and maturation.--Food consumed by fives at the noon school meal provides one-third of the daily requirement of iron, over one-third of the calories and all of the other nutrients. Vitamin A and ascorbic acid are high (Samenfink, Schuck and Opheim, 1958). The percentage of protein derived from animal sources in the diet is 69.0 for boys and 72.3 for girls. Patterns involving extreme shifts between high and low are rare, whereas patterns involving consistent ratings in successive age periods from one to eighteen are relatively common. The percentage of calories derived from proteins is 12.9 for boys and 13.3 for girls (Burke and Others, 1962).

Perceptual-motor abilities.--Fives with very high ratings for classroom adjustment score above the lowest quartile on the Frostig Test Children rated as very low in classroom adjustment score below the 33rd percentile on the Frostig Test (Frostig, 1963; McBeath, 1968). Differences also exist between the visual activity of those children who score low on the Frostig Test and those who score high (McBeath, 1966). Six percent of fives given auditory tests were referred to a private physician for further testing. This incidence of hearing loss is approximately the same as for school-age children and is thought to warrant the development of screening programs (Ashley and Seshin, 1962). On the Frostig Test Indian fives fall in the lowest quartile and have greater variability than the Anglos. Over a period of five years 27 percent of Indian children were retained in first grade. There was no correlation between their visual and auditory perceptions (Lowry, 1970).

Perceptual-motor training programs have been found to result in increased school readiness (Rutherford, 1965; Ellerman and Wadley, 1970). However, training programs are not always adequate to overcome visual-motor deficiencies. Forty percent of fives in the experimental group and 57 percent of the control group continued to have poor visual-motor skills after training. Training procedures of the Winterhaven templates are too rigid and take too long for many fives. Immature and unsettled children profit least from the activities (Keim, 1970).

Speech.--Five-year-old cleft palate children are less proficient in articulation than normal threes. Normal children are more proficient on each consonant sound without exception, although differences on the w, m, n, and h sounds are slight. Cleft palate children make substitution errors more than twice as frequently and omit sounds four times as frequently as normals. Substitution errors account for the majority of all articulation errors in both groups (Bzoch, 1965). On learning to imitate non-English sounds, there is no difference between sound learning and auditory memory span, but a slight difference between sound learning and auditory proficiency does exist. Fives can learn new articulations at the same rate as sixes but less accurately (Locke, 1968).

Anglo children of undesignated or mixed socioeconomic background, mixed ages

Dominance, handedness and laterality.--Eighty-one percent of children two through five years old demonstrate ear dominance, 70.33 percent for the right ear. Only 54.06 percent have established dominance in all four aspects (foot, hand, eye and ear). Sixty-five percent of these are completely right dominant (Sinclair, 1968).

As early as age four, right-handed children ranging in age from four to nine, report more accurately on digits arriving at the right ear. This effect is present for both boys and girls, although boys achieve lower total scores than girls (Kimura, 1963). Right hand grip of preschool children is stronger than left hand grip in performing isometric contractions, remaining approximately the same from the first to the second day while the left hand grip becomes weaker on the second day. Thus the non-dominant hand is more vulnerable to fatigue. Isometric contractions of both the dominant and non-dominant hand have the effect of increasing the difference between right and left grip strength while emphasizing the dominance of right-hand strength (O'Connor, 1970).

Nursery school and kindergarten children do not differ from each other in errors in left-right visual fields but school children show differences favoring more accurate perception in the right visual field (Dyer and Harcum, 1961).

Growth and maturation.--Children, one to seven and one-half years, show a wide variety in individual ossification increments. While one child may exhibit no new centers of ossification, another may gain many during the same age interval. Girls are consistently advanced over boys in the incremental pattern by an amount approximating six months increment. Most children deviate from the median trend line in their ossification pattern. Correlations between individual ossification increments and height and weight indicate that no inference can be made about height and weight from knowledge of ossification increments (Garn, Rohman, and Robinow, 1961). Between one and one-half and twelve and one-half, children who are about one standard deviation above the average in fat are about 0.35 standard deviation above the average for their size. They are taller than the average for their age by an amount equivalent to about one-half a year's growth. Children one standard deviation above the average in outer fat are advanced skeletally by approximately 0.4 years (Garn and Haskell, 1960).

Perceptual-motor abilities.--Discrimination of letter-like forms is accomplished with few errors by children of four through eight years with errors declining with increasing age. Perspective shift errors are very high and decrease only slightly with age. Errors for rotation and reversals start out high but decline almost to zero by age eight. Least errors are caused by break and closure transformations. Similar results are found with real letters, although total numbers of errors is less (Gibson and Others, 1962). Kindergarteners and second graders on a form discrimination task respond differentially by eye and hand to orientation and curvature. In the haptic task left-hand reversals and up-down changes produce figures that are felt to be very unlike the original, even when the children are aware that the figure has only been turned around (Goodnow, 1969). Orientation of a form is an important determinant of response. Greater difficulty is experienced in discriminating between an originally learned figure in upright and inverted position than between the inverted figure and unfamiliar stimuli (Hunton and Hicks, 1965). Preschool children tend to rely heavily on focal point location as a discrimination cue, using the lower half of figures such as upside-down triangles and pentagon stimuli as cues. With increasing age top to bottom scanning plays a progressively greater role and less reliance on focal point location is observed (Kerpelman and Pollack, 1964; Strang, 1967; Dodd and Strang, 1966). Between five and eight years, picture naming in an unstructured array results in errors of omitting or misnaming an object picture whereas no such errors are made on a structured array. There is an age related decrease in unsystematic patterning and an age related increase in complex patterning in the unstructured array. Top-bottom patterning increases with age while left-to-right patterning first increases and then declines across the age levels tested. All children use patterning on the structured array. Two patterns, left-to-right and triangular, are used (Elkind and Weiss, 1967). Position and length discrimination is consistently easier for normal threes to fives than for older psychotic children. Position discrimination is easier than length discrimination. In position learning, the middle positions are easiest to learn while in length discrimination the two extremes are easiest to learn (Hermelin and O'Connor, 1967).

With threes through fives in a color versus form task, younger children (three to five) prefer color matching while older children (seven to eleven) prefer form matching (Corah, 1964). When the color form matching task involves fives and sixes and when it is a more complex task in which color characteristics differ in hue, brightness and saturation or some combination of these, brightness produces a greater number of color matches than either hue or saturation differences. Differences in hue alone do not have any effect on color matching and the combination of color characteristics has no greater effect on color matching than brightness alone (Corah and Gross, 1967). Form is the dominant concept for fours and fives on a color form reading task (Cramer, 1967).

Reaction time to tactile stimulus on the lower lip decreases with age before age seven. In contrast, reaction time to a pure tone changes little over the range of about four years to eleven years (Siegenthaler and Bianchi, 1968). Preschool children have a faster response speed when given a "ready" signal than when no such signal is given. Continuously and immediately rewarded groups perform faster than groups experiencing partial reinforcement, varied delay or constant delay (Sheikh, 1967). In terms of locus of the perceiver, there is no shift from an allocentric locus in threes through fives, but there is an increase in the anterior locus, forward looking view and a decline in the anterior locus, backward looking view (Pedrow and Busse, 1970). Perceptual-motor functions improve during the nine month period between four years four months and five years five months with boys showing more overall growth. Disagreement exists regarding sex differences, whether girls and boys are about the same at this age or whether girls are superior (Sapir, 1966; Siegenthaler and Barr, 1967). On the Stick Design Test there is a linear decrease in mean number of errors between the ages three and seven (Wise, 1968).

No single method of visual motor discrimination appears to be best as preparation for teaching words to all fives and sixes. On training trials more correct responses are made for tracing than for matching, and matching is better than rearranging. On the reading task similar words are harder to read than dissimilar words and similar words result in more errors (Jensen and King, 1970). Pretraining of fives and sixes in attending to directional differences between the letters b and d facilitates learning the names for these letters but pretraining in making a consistent motor response to the directional differences does not make a difference in this learning (Hendrickson and Muehal, 1962).

Speech.--Echoic behavior of preschool children shows a decrease in the frequency of errors which is different for each age between three and five. Consistency of specific error response increases with age. Errors made are inversely related to the frequency of sounds in the repertoires of infants and to the frequency of the sounds in the English language. More errors are associated with the place of articulation than with either the manner of articulation or the voiced-voiceless dimension (Bricker, 1967). Fives and sixes, chosen initially on the basis of high or low scores on the Templin Speech Sound Discrimination Test, show differences in favor of the high group on articulation. The high group also has a higher IQ than the low group (Sherman and Geith, 1967). Conjunctions and pronouns make up a greater proportion of stuttered words than total words in the two through six age range whereas nouns and interjections make up a smaller proportion (Bloodstein and Gantwerk, 1967). Disrupted linguapalatal taction does not result in misarticulations among children below five and one-half. The total number of misarticulations, the number of misarticulated consonants and vowels, and the number of distortions, substitutions and omissions are not altered by the disruption of taction (Weiss, 1970).

Vitality.--An emotionally induced increase in work capacity and greater resistance to fatigue in the presence of another in comparison to working alone appear only from the age of five to six onward. This increase of electrical activity in muscles and their capacity to perform a motor task on the ergograph in the presence of agemates was not observed in threes and fours (Missiuro, 1963).

Negro children of undesignated or mixed socioeconomic background, mixed ages

Growth and maturation.--The absence of demonstrable early neurological deficits in prematurely born children does not necessarily imply a good prognosis for learning at later ages. Comparisons with normal threes, fives and sevens indicates subtle distinctions seem to persist in those aspects of the learning process which, like reading, writing and spelling, require a high degree of differentiation and integration. The prematures' central nervous system functioning seems more primitive, their behavior controls less firmly established, and their neurological integration lower than that of the maturely born subjects. They present subtle difficulties in motor, perceptual, visuo-motor and linguistic patterning (De Hirsch, Jansky, and Langford, 1966).

Children of undesignated or mixed socioeconomic background, mixed ages, and mixed ethnic background

Balance, movement and coordination.--Motor development represents the area in which five and six-year-old mongoloid children are most mature. They are capable of walking, running, squatting, climbing stairs with support and have adequate motor coordination for the performance of simple tasks such as stacking blocks and stringing large beads (Thompson, 1963). In threes, fours and fives with brain damage, matched for CA, improvement is greater in ambulation and hand skills after participation in a Montessori program than in an orthodox program. Matching according to IQ and MA results in greater improvement in hand skills for the Montessori children and greater improvement in ambulation for the orthodox children (Argy, 1965). Normal preschool children enrolled in a Montessori program show a positive relationship between positive learning attitude and sensory-motor coordination and verbal ability (Fleege, Black, and Rackaukas, 1967).

The leading causes of accidents among twos through fives are falls, cuts or piercing, poisonings, and transportation accidents. Twos and threes account for 24 percent and fours and fives account for 17 percent of the accidents among children under fourteen years of age (Keddy, 1964).

The effects of assessment and personalized programming were studied with prekindergarten children extending into elementary school. Prekindergarteners who were low on motor abilities including ability to jump on each foot, jump in position and walk a balance beam backward and forward were given twenty minutes of instruction emphasizing motor skills. Superiority of both boys and girls in the experimental group was found at the end of kindergarten. At the end of the primary year boys participating in the motor program scored higher and showed greater growth in motor skills; those participating in the visual program also scored higher in motor skills and made greater growth in cognitive skills (Coffman and Dunlap, 1968; Dunlap and Coffman, 1969).

Construction with manipulables.--Instruction and practice in three skills--visual discrimination, manual dexterity, and verbal mediation--and practice in visual discrimination and manipulative skills produce gains in puzzle assembly skills in preschool children. Failure of the stories treatment to produce similar gains indicates that the type of experience provided in instruction is a critical factor in the learning of puzzle assembly (Lombard, 1968).

Growth and maturation.--Wide variations are found in the intake of various nutrients of preschool children. Most children show a characteristic pattern of food intake which varies from infancy into early childhood and reveals a change in the curve of intake of nutrients as the consumption of specific foods changes. There is a decrease in the intake of calcium, phosphorus, ascorbic acid, iron, vitamin A and riboflavin (Beal, 1961). Calcium, vitamin A, iron and calories are among the least well supplied, particularly among low income groups (Metheny and Others, 1962; Burke and Others, 1962; High, 1969). Serum cholesterol is not related to total caloric, carbohydrate, fat, and protein intake (Beal, 1965). However, protein supplementation, whether from animal or plant sources, results in an increase in the percentage of albumin which does not occur with a protein-free supplement (Hanafly and Others, 1967). A shift from lower to higher calories is experienced as the frequency of between meal eating increases in fives and sixes. Children who report eating no sweet or sticky between meal items the day prior to the health conference show 3.3 decayed, extracted, or filled teeth while the children who report eating four or more such items exhibit 9.8 decayed, extracted, or filled teeth (Weiss and Trithart, 1960). Differences in bone width and muscle are found among African children, ages three and one-half to seven and one-half, who have maintained weight at a high level from birth, whose weights have been at a consistently low level and whose weights have been at a high level but have fallen during the first year. No differences are found in bone length or subcutaneous fat (McFie and Welbourn, 1962).

Measurements of bone, muscle, and fat increase more rapidly in the first year of life than in subsequent years. Also evident is the decrease in width of fat measurements after one year of age, while the muscle and bone widths continue to increase. The rate of change with increasing age is not the same for each tissue at the different age levels. Larger values of fat measures for girls are apparent at all ages (Maresh, 1961). In boys from age three to seven the most important factor influencing variation in weight is variation in the general development of the flesh mass. For girls ages three and four height leads chest girth squared and calf girth squared, but from age five on, calf girth assumes the leading role (Lu and Savara, 1962). Rate of skeletal maturation is also different for boys and girls with girls having a higher mean rate of growth between five and six years (Marshall, 1969; Hansman and Maresh, 1961). In a comparison study of Kampala African, Kampala European and English children, the weights and the heights of the girls are similar but there is a marked superiority of the European children in both groups to the Kampala African children in both height and weight (Welbourn, 1961). Physical growth is satisfactory in children with galacto semia; however, skeletal age is retarded in over 50 percent of the children without relation to age at time of diagnosis, diet or intelligence. Early diagnosis followed by immediate institution of treatment permits more satisfactory mental development (Donnell, Collado, and Koch, 1961).

Perceptual-motor abilities.--Incidence of visual defects among preschool children is high enough to support recommendations of large scale vision screening programs (Michigan Department of Health, 1965; Hatfield, Barrett, and Nudell, 1967; Trotter, Phillips, and Shaffer, 1966; Burman, 1969; Gibbons, 1970; Kripke, Dunbar, and Zimmerman, 1970). The high incidence of amblyopia (presently one in twenty children) and the number of partially sighted children provides justification for this screening (Burman, 1969; Hatfield, Barrett, and Nudell, 1967). Refractive errors, strabismus, and amblyopia can be identified and should be treated in early childhood (Kripke, Dunbar, and Zimmerman, 1970). The incidence of color deficiency among fives and sixes is 0.5 percent for girls and

3.0-3.5 percent for boys (Lampe, 1969). Accommodation decreases with an increase in age between five and seven years. Girls' accommodation exceeds boys'. Suburban children's accommodation exceeds that of urban children (Eames, 1961).

In the maturation of auditory abilities of three to thirteen year olds there is an increase in acuity over the age range of four to nine with the majority of the improvement occurring before eight years. Speech intelligibility increases 5 percent with most of the change occurring before six years. Noticeable is the decrease in localization error which is at 18 degrees at age three but which by age eight is at approximately 5 degrees. Girls are consistently more disturbed by interferring noises. Differences are found in responses to fragmented speech signals at all age levels. Reaction time decreases as a function of age and for both sexes for both auditory and tactile stimulation. The auditory reaction time is relatively stable across the age range, especially beyond age five. The auditory and tactile reaction times are approximately equal for subjects under five but markedly separate with tactile reaction time being shorter for older children (Siegenthaler, 1969). Auditory screening of fours and fives identified approximately 10 percent as having a hearing loss (Griffing, Simonton, and Hedgecock, 1967). It is believed that correction of hearing defects at the preschool age for both the culturally and economically deprived will improve their educational achievement (Michigan Department of Health, 1965). By comparison with normal children, hearing loss children between ages three and seven are less able to reproduce auditory than visual patterns while there is no difference between auditory and visual scores for the control group (Sterrit, Camp, and Lipman, 1961). On tests of auditory discrimination using noisemakers and word pictures for stimuli, threes were able to identify three of eight items and fives were able to identify seven items. With word pictures the six year old can identify 21.5 of 24 stimuli. Maximum growth is reached on these tests by age six (Martin and Others, [illegible]).

In form copying, judged on the basis of eight characteristics--form, curvature-linearity, open-closedness, number of parts, relationship of parts, orientation on the background, size of relationship, and intersections--two and one-halfs to fives improved with age in accuracy of reproduction for each of the characteristics judged and for each of the designs and in qualitative organization judged on the basis of whether it showed a change from the original (Graham, Berman, and Ernhart, 1960). In a study of motor control as a copying pattern of preschool children, CA is positively correlated with speed of orientation, acceptance of structure and motor control. A positive relationship is also found between IQ and speed of orientation and IQ and motor control. The brighter child is quicker to perceive meanings and implications of test instructions and is more likely to have advanced motor skills. Motor control correlates significantly with speed of orientation, acceptance of structure, quality of participation, capacity for social relationships, autonomy, accepting limits, lack of overt tension and self-feeling. Stress in relation to newness and difficulty is likely to become observable in the form of motor awkwardness, stiffness, restraint or limpness (Moriarty, 1961).

In testing brain injured threes through fives, the copy-forms test is too difficult for the very youngest children. The Mark-Car Accuracy Test is too easy for the children over five. Age is the most important variable affecting performance on vocabulary, conceptual and perceptual-motor tests. Intercorrelations among vocabulary, conceptual and perceptual-motor measures suggest that the various tests are to a considerable degree independent of each other (Graham and Others, 1963). The performance of brain injured children is inferior compared to that of normal children but it is not equally impaired on all measures. Impairment is marked in the cognitive and perceptual-motor areas and relatively slight in the area of personality functioning (Ernhart and Others, 1963)), Comparison of normal three through five year olds with retarded children with MA's between three and five years shows color recognition and discrimination to be learned before auditory and aural discrimination and visual discrimination with a gap between normal and retarded groups. The gap widens in the aural discrimination test which is dependent on a knowledge of words and language. Training makes a difference in both groups with children receiving the most training making the highest scores (Lipman, 1969).

Willingness of threes through fives to perform a difficult perceptual task such as buttoning or working a puzzle is independent of ability. Older children are more skillful than younger (Starkweather, 1966). Movement speed of nursery school and kindergarten children in putting marbles into a tube is increased by reinforcement and continues to be faster on non-reinforcement trials than in the control group (Penny, 1960). It is estimated that between three and four, 40 percent of perceptual growth has occurred and that 20 percent occurs between four and seven. Not until age six is the child able to accurately perceive the visual stimuli requiring the integration of several visual skills (Martin and Others, 1969).

Self-care activities.--Cerebral palsied threes, fours and fives followed up to sixteen, seventeen and eighteen provide information of prognostic significance. No cerebral palsied child with an initial IQ under 50 was able to secure employment of any sort as an adult. Spastic groups tend to have the highest IQ's, achieve a higher level of schooling, function at a more independent level in self-care activities and in a social and economic sense. High levels of self-care correlate highly with employability, school achievement, general economic status, social integration and interpersonal adequacy in functioning (Klapper and Birch, 1969).

Speech.--The learning curves of kindergarteners and first graders suggest that the vowel "oe" is learned gradually through successive approximations to the model utterance. Consonants are learned in a more dichotomous fashion. A common response to q is s. Few children can produce close accoustical approximations to x. Almost all children can produce h with markedly fewer producing k or both h and k. Fives can learn new articulations at about the same rate as sixes but they learn them less accurately (Locke, 1969). Errors in echoic speech of threes through fives decrease with increasing age with differences between all three ages. Although the absolute errors decrease with increasing age, the consistency of a specific error response increases with age. Fewer errors are made on sounds that occur most frequently in the English language. The place of articulation is the primary source of error while errors of voicing and manner of articulation occur much less frequently (Bricker, 1967). The tongue-thrust swallow (low, forward tongue and a slightly depressed mandible during swallowing) pattern appears to be the normal one among fives and sixes. Most of the children, 89 percent in this classification, articulate the sounds t, d, l, n, t, and z in dental and low interdental position. Stuttering by twos through sixes occurs on all parts of speech, distributing itself as the parts of speech are distributed in their language. To the degree that a grammatical factor is present, pronouns and conjunctions are associated with larger amounts of stuttering in this age group whereas the important content words (nouns) are responsible for most of the stuttering in adults (Bloodstein and Gantwerk, 1967)

Prior to training in a specific speech improvement program, experimental and control groups of kindergarteners and first graders were similar on the Speech Battery. Immediately after the training, differences were apparent but decreased during the four month interim following the training. The two groups did not differ on the Wepman Auditory Discrimination Tests during any testing period. By the middle of the program the LSES and MSES groups had almost doubled their percentage of perfect scores and the high group had improved from 28-71 percent. By the second grade LSES groups had improved as well as MSES groups, but HSES groups were still better than both (Byrne, 1962). An experimental group of three and one-halfs to five and one-halfs trained on the ITA showed greater improvement in articulation than controls (Goldman, 1968).

Cleft palate children at all age levels from three to nine show consistent and substantial weaknesses in vocal and gestural expression and in visual memory relative to their performance in other areas of psycholinguistic functioning. Performance is progressively poorer in each language area as age increases. Although the language scores are consistently higher at each age interval, they are consistently lower than the appropriate CA (Philips, 1969; Smith and McWilliams, 1968).

Speech development represents the most obviously limited area of development in mongoloids of five and six. Speech in the mongoloid develops during the fourth, fifth and sixth years. Most are able to combine words and use simple sentences. None can use words relating to spatial relationships such as "in" and "on." Articulation is poor and many of the words consist only of their initial sound (Thompson, 1963).

Summary of findings in psychomotor domain

Comparisons between ADV and DADV, between under fives and fives, and between Anglo and Negro children are made difficult by the nature of the data. No studies were found of ADV Negro fives or ADV Negro children of mixed ages. Only one study was found of Negro fives of undesignated SES. Few studies focus on one age group while the majority include from a two to five year age span with infrequent designations of the actual abilities of children of a given age. Few studies make comparisons between ADV and DADV although it may be known that both SES levels are included in the study. Studies for one SES level have not been replicated with other SES levels. The same problem holds for differences in Anglo and Negro children in terms of comparative data and replication of studies. Behavioral characteristics are seldom described. Data tend to be reported in terms of scores on tests or factors affecting performance on a specific task rather than on developmental abilities.

Socioeconomic differences.--Compared to a "normal" population DADV Anglo and Negro under fives are shorter in height, lower in weight, and have a smaller head circumference. DADV children of undesignated racial background and mixed ages show normal to below normal weight and height.

Diets of ADV under fives meet or exceed 1964 standards in calories, protein, iron, vitamin A, calcium, thiamin, riboflavin, and ascorbic acid. Vitamin A and B complex deficiency signs are prevalent in DADV under fives. Also prevalent in DADV children of all preschool ages are physical problems, many of which are not under care. Most frequently identified are dental diseases, diseases of the nervous system, asthma and other allergic conditions, nutritional diseases, respiratory diseases, skin infections, enuresis, hernias, speech abnormalities, and vision and hearing losses. Physical problems in the DADV are often found in conjunction with personality problems, neurological problems, mental retardation, and differences in physical size. Habits such as nailbiting and thumbsucking are less frequent in the DADV than in the ADV.

ADV under fives show superior abilities to DADV under fives in stick-design copying. They also seek complex stimulation situations as compared to simple situations. Problems are encountered in measuring the perceptual abilities of the DADV under fives which involve their inability to reach a minimum score, sometimes associated with inadequate speech development and inability to indicate directions. Developmental deficits are found in DADV under fives in motor speed and visual attention span. DADV fives also show deficits in perceptual-motor functioning of about one year. DADV children of mixed ages are more impulsive in motor responses but no less able to inhibit motor responses than ADV.

Effects of training programs for DADV children are not predictable. Children make gains in some programs but not in others. ADV children make gains in training programs in auditory and visual discrimination which DADV children do not make. Gains of the DADV children appear to be affected by the age of the children, their abilities, and the type of training received, but no specific pattern of relationship is identifiable.

Age differences.--ADV under fives can copy designs with sticks with increases in this ability being primarily a function of developmental age. Age difference also appears in ability to act pantomimically, with a two-year lag at age five between ability to respond to pictures and ability to respond to real objects. Under fives are not fully aware of the temporal aspects of delayed auditory feedback and make fewer changes than fives, who decrease their word rate by more than half and increase the percentage of prolonged syllables, repeated words, and repeated syllables. ADV fives have not established foot dominance, hand dominance, eye dominance, or left-right awareness of their own body parts and they are not able to increase scores on the Draw-A-Man test after visual cues are given. Between four and six, ADV children improve in auditory discrimination. High potential kindergarten children are identifiable with the Bender-Gestalt test but scores do not predict later school achievement.

DADV Negro under fives are very poor at copying letters of the alphabet and Arabic numerals. By five they become more skillful. Negro under fives are also poorer in left-right differentiation than children older than five and one-half. DADV under fives of mixed ethnic background make many errors in copying, drawing, describing roundness, pointedness, or squareness of an object. After training, fives have no trouble making these discriminations. DADV under fives of mixed ethnic groups are able to make a scorable response on making a felt person but cannot copy the picture made. DADV Anglo fives can make discriminations required to sort triangle and circle cards but may not be able to draw these freehand. Under fives given only verbal instruction on how to assemble form boards and puzzles regress while children given practice and practice and verbalization treatments make gains. In the learning of articulation through imitative responses, DADV under fives are de-dependent upon at least partial reinforcement; under fives also do not correct their inability to correctly pronounce words on the basis of practice which requires discrimination between correct and incorrect responses. Eye-hand confusion problems exist among 50 percent of five-year-old DADV children.

Among studies of children in which socioeconomic status is not designated, under fives fail to establish a basal score on left-right discrimination; but beginning at five, errors decrease. Success in color matching increases with age with errors decreasing rapidly from three to five and less rapidly after five. The most preferred color is blue, followed by red, green and yellow. Color tint matching also increases with age with different colors not discriminated with the same degree of accuracy. Green is easiest for fives to discriminate. Figure identification of light figures on a dark ground and dark figures on a light ground by under fives improves with age, practice, and distinctness of figures. Fives match figures such as firetrucks, lemons, and lakes more easily than they match squares. Houses drawn by under fives after they have seen an adult draw a house resemble the adult drawn model more than the original houses drawn by the children. At 46 months children begin to include a mouth in their figure drawings and they do not change their drawings when questioned about other features.

Toys preferred by under fives from a larger selection include sound cans, wooden table blocks, color lotto, and the flannel board. In the selection of blocks to be played with, position is a more important determinant than color. Gross discriminations in size are made by under fives in block play, but there children inaccurately estimate body size in terms of reaching for objects too high. Mature jump for distance is accomplished before five, as is singing tunefully in the middle C-F range, but not all fives can successfully handle a toothbrush. Taste sensitivity of under fives does not differ from their parents. Fives make greater gains on a motor pursuit task than younger children. They can control operant motor responding when saying the operants aloud but not when whispering them. They are less spontaneous in their discrimination of mirror-image reversals than first graders. They are more willing to try a difficult bean bag target game when in pairs than when alone and are least willing before a class.

Ethnic differences.--ADV Anglo under fives enrolled in an experimental program to provide instruction in body orientation perform better on the Rod and Frame Test and on several subtests of the Frostig Test than Negro children. As measured by the UCLA Visual Discrimination Inventory, age differences appear in Negro fives which do not appear in Anglo under fives. ADV and DADV Anglo fours and fives are not different in their performance whereas ADV Negro children show gradual growth from the third to the fifth year with DADV Negro under fives making meager gains from the third to the fifth year so that by the fifth year they are not superior to the average three-year-old Anglo child. Negro DADV fives are more skillful than DADV Anglo fives at tasks demanding physical coordination and sensory perception. Negro Head Start fives are, nevertheless, characterized by a comprehensive lag of about eight months in visual-perceptual development when they enter first grade.

Analysis of factors affecting anatomic, physical and psychological growth of Negro under fives of undesignated SES reveals that intragroup variations are similar, both in range and in factors relating to the variation, to those long accepted as existing among Anglo children. Compared to Negro DADV under fives, Anglo DADV under fives have higher blood cell volumes and higher mean skin volumes. Negro under fives are taller than Anglo under fives. The Negro boys as a group are the tallest, heaviest, leanest, and most anemic while Anglo girls are the shortest, fattest, and had the best scores on mental maturity. More health problems occur in Negro DADV under fives and congenital malformations are more frequently identified, but a larger percentage of Anglo DADV under fives are hospitalized with a larger percentage of hospitalizations due to illness.

Cognitive Domain

Advantaged Anglo children under five years of age

Concepts.--When children are asked to respond to commands which vary in complexity, a definite age trend for most commands is found. The number of failure types decreases across the three to four and one-half age range while the number in the correct performance group increases. Commands which are least able to regulate the child's behavior have the following characteristics: 1) most complex syntactic structure, 2) require simultaneous attention to a larger rather than a smaller number of conditional factors in a situation, and 3) the behavior they instigate extends over a longer rather than a shorter time period (Beiswenger, 1968).

The perception of children in ordering five sets of pictures from youngest to oldest reveals that more of the children age four and one-half and older order the pictures correctly than those under four and one-half (Britton and Britton, 1969).

Experimental and control children, in a two-choice discrimination problem, produce behavior resembling their model. They do not overlap in types of imitative responses. Further, social rewards have a facilitating effect on imitation, and aggression is readily imitated by all the children. Nurtured threes and fours exhibit more predecision conflict behavior than non-nurtured threes and fours (Bandura and Huston, 1961).

The results of the Preschool Inventory for a summer Head Start group when compared with a University of Kansas nursery school group show the nursery school children (although somewhat younger) to be better in all areas on both the pre- and posttest. In the areas of number concepts and ordination and concepts II, the Head Start children's performance at the end of the summer is no longer significantly different from the nursery school group's performance during the third and fourth week of the summer (Horowitz and Rosenfeld, 1966).

Intelligence.--There is less difference in IQ points for MSES fours on the S-B than for LSES fours (Wellerman, Broman, and Fiedler, 1970).

Language.--The objects of a child's communication vary as a function of social setting. A child in each succeeding preschool age group emits significantly more information processing predicates to another child and most of this increase is of a simple talking or communicating type. A significant portion of the increase is in verbal cognitive communication (Honig, Caldwell, and Tannenbaum, 1969). Examining children's reactions to sentence command, two types of commands are found to be least able to regulate the child's behavior. The two types have these characteristics: 1) they have the most complex sentence structure and 2) they require simultaneous attention to a larger rather than a smaller number of conditional factors in the situation. The behavior they instigate extends over a longer rather than a shorter period of time (Beiswenger, 1968). White MSES children in a free speech situation use proportionately more complex sentence types when compared with Negro LSES children (Osser, 1968; Osser, Wang, and Zaid, 1969).

From a very early age children can analyze the structure in their own speech. The three year old can make cognitive statements, including those he may not have heard before. He understands and can interpret correctly cognitive sentences without emotional charge. The three year old not only names but also makes statements that are predicational and cognitive and may refer to events in the more distant past which have a future sense or intent but which are not just demand for action and which involve pretense or possibility. From about age two and one-half on the child uses language as an instrument of exploration with syntactic play, arrangements and rearrangements, transformations of sentence types, and substitution of words in fixed sentence frames. The three year old gives evidence he has the concept of a sentence, which indicates understanding of grammatical relations (e.g. subject-predicate, object of a verb) and that these are well marked in his own speech. The child of three expresses the basic sentence relations with great precision in English and has the ability to make demands, give commands, negate propositions and ask innumerable questions (Bronowski and Bellugi, 1970).

A study of the language of three children shows that by the age of thirty-six months they were producing a first derivative of occasional questions, a kind of invention that might develop if the grammatical rules were in the process of formation. The children produced a kind of question which is neither the occasional nor the normal form, but an "ungrammatical" creation that lies midway between them, i.e. "What John will read?" All three children started giving well-formed answers of a given type before they themselves constructed Wh questions of the corresponding type (Brown, R., 1968).

The grammatical rules for expressing complex meanings develop along with the meanings. The three year old organizes his vocabulary into categories of adult language. These then are combined not by naming but by grammatical principles which include hierarchical organization of the parts. In general he forms and extracts rules from the sentences he hears and reorganizes them in his own speech. Examining the use of the

English plural, it is noted that the same three children supplied the plural correctly when the requirement was within the noun phrase boundary. These data suggest that one aspect of language development is the extension of linguistic dependency relations across larger units (Cazden, 1968). The sentences of three and four year olds are marked by the age characteristic of "rules of maximum generality," causing overextension with gradual narrowing to greater precision of application (Bronowski and Bellugi, 1970). Overgeneralization results in noticeable errors with irregular verbs and irregular plurals for nouns. These irregular forms are often used correctly by the child before he begins to generalize, as a result of having learned the irregular form by rote. Particular forms of parent interaction have less effect on the child's development of more strictly grammatical aspects of the total language acquisition process than on the more cognitive aspects (Cazden, 1968). Basic grammatical structures seem to be learned despite the variation in the child's linguistic environment, while the ability to use language to express ideas may be more vulnerable to the variation (Cazden, 1968; Brown, R., 1968).

Various programs use the PPVT to measure receptive language in this age group with varying results. Pre- and posttests over a seven month interval showed gain scores equal for children in a Montessori school, a conventional day nursery school, and with no nursery school experience (Prendergast, 1968). University of Kansas nursery school children made significantly more responses than a group of Head Start children but showed no gain between pre- and posttest (Horowitz and Rosenfeld, 1966). Fours fail to verbalize scorable reasons from observing a model perform conservation tasks (Rosenthal and Zimmerman, no date).

General cognitive.--On transposition tasks the Very Far group (six-step) task was more relational than the Far group (three-step). The Near group (one-step) was more relational than the Very Far and Far groups on the first test but less relational than the Very Far group on the second test. These results hold for children who lack as well as those who possess functional labels and for children younger than four as well as older than four and one-half (Caron, 1967).

From no conservation in the baseline phase, fours increase their judgments of equivalence in imitation and the generalization phases significantly. The children fail to verbalize scorable reasons from observing the model perform (Rosenthal and Zimmerman, no date).

Advantaged Negro children under five years of age

Ability, specific.--A follow-up study of children initially observed at age four shows that MSES children receive higher grades and test scores than do LSES children. Maternal control strategies, ability to teach effectively (as defined in the preschool phase) and affective behaviors are related to academic grades and standardized test scores. The child who does well in school is likely to have a warm, supportive mother who stresses personal-subjective control strategies and avoids imperative commands and status -normative appeals. His mother also uses effective teaching techniques such as orienting the child to the task, giving specific feedback, accompanying directions with rationales, eliciting the child's interest and cooperation, and giving praise. The mother's use of standard English is found to affect the child's performance to the same degree as her control strategies, teaching styles and affective behavior (as rated by the home interviewer) (Hess and Others, 1969).

Concepts.--The degree of informational specificity in Negro mothers' teaching their children how to sort by color, shape, height and mark varies with socioeconomic status and the degree of situational press (Brophy, 1970). MSES children taught sorting tasks by their mothers performed well above LSES children, particularly in offering verbal explanations as to the basis for making their sorts. They scored higher on using descriptive and categorical responses, which was interpreted as showing more reflection and evaluation of alternatives and more objective and abstract thinking (Shipman and Hess, 1966).

Intelligence.--On the S-B and Columbia Mental Maturity Tests, MSES groups give higher predictions of scores they will attain than both upper and lower LSES groups. The ULSES group gives a higher prediction than the LLSES (Brophy and Others, 1965).

Language.--MSES children uttered longer and more complex sentences with relatively fewer nouns than those in the LSES group when colored slides were used as the stimulus. About 57 percent of their utterances were complete sentences and most used compound or complex sentences. MSES and LSES children differ in total vocabulary and the number of different words. They differ most in relative use of noun and verb clauses (Weener, 1966).

Mediational processes.--Mothers tending to a personal-subjective orientation or a cognitive-reactional teaching style manifest a more elaborate linguistic code. These mothers were more middle class (Olim, Hess, and Shipman, 1967). The mothers' language styles were definitely related to the child's performance on these tasks. Maternal teaching behaviors (control, linguistic) are as useful or better than their IQ or social class as predictors of their child's behavior (Hess and Shipman, 1968).

The lower the IQ was (MA held constant) the lower the mediational facilitation of children. Qualitative aspects of the sentences formulated for the subjects had no relation to the efficiency of verbal mediation (Milgram, 1968).

General cognitive.--Longitudinal data obtained from the preschool phase measure of curiosity indicates that it is of little use in examining cognitive development. Measures from the children's free play behavior are more in accord with the model of curiosity behavior. They were meaningfully associated both with some postulated antecedents of active exploratory behavior (maternal control strategies and teaching behaviors) and postulated consequents (children's ability to perform successfully and to avoid detrimental behaviors) (Hess and Others, 1969).

Advantaged children under five years of age, mixed or undesignated ethnic background

Attentional processes.--Total fixation time or the total time the subject oriented his head and eyes toward a screen reveals no differences for either the experimental or control group, nor any between-group differences. Response recovery in the experimental group is highly significant. For both groups response recovery also occurs when every set changes. Total fixation time for the three and one-half year old can be considered part of the orienting reflex in that response decrement occurs to repeated stimulation and response recovery occurs when the stimulus is varied. Distribution of attention can be a function of novelty and familiarity (Bushell, Wrobel, and Michaelis, 1968). More children from a non-deprived background prefer complex figures and novel stimuli than Head Start children, who tend not to have this preference (Hicks and Dockstader, 1968).

Ability, specific.--Children admitted early to kindergarten are generally successful in later school life. As they progress in school, the relative standing of the underage children improves (Miller, 1962; Hobson, 1962). The Academic Preschool children are superior to Montessori children on the WRAT but the Montessori group shows greater variance on arithmetic and spelling. Only one child in the Montessori group could read while thirteen out of eighteen Academic Preschool children scored at or above 2.0 (Bereiter, 1967).

Third grade reading ability was compared with preschool play activities. Underachievement and amount of time spent outdoors in the winter, the amount of time spent with the mother in outdoor activities, and the amount of time spent with the father in outdoor activities show a significant relationship. The amount of time spent indoors with father is also in favor of the underachievers, who also spend more time outside with both parents. The underachievers tend to spend more time outside in the summer. Achievers spend two hours, thirty minutes daily watching television while underachievers spend one hour fifty minutes (Wells, 1970).

Three year olds can follow a television cartoon and read appropriately "no" and "no, no" when spoken by the characters. More than 90 percent of them could still read the words in a posttest given one week later. More than 50 percent could read the additional three words and combinations taught them in the following two lessons (Cobb, 1970). Another program reports no three year old learning to read well enough over a five month period to be tested on a standardized test. Individual children did learn from twenty to fifty words, twenty or more letters of the alphabet, and one could sound out words from their spellings (Bereiter, 1967).

In a classification task Treatment I children who use pictures of familiar objects score higher than the control group on the Hierarchical Classification Test Form 1. There is no difference between younger and older children on Form 1. On Form 2 of the HCT, Treatment$_1$ and Treatment$_2$ (children with whom pictures of geometric designs were used) score higher than controls. Older children do score higher than younger subjects on Form 2 (Ward, R., 1969).

Concepts.--MSES children learn discrimination tasks faster and make more correct responses when effects of Verbal-Nonverbal, Reward-Nothing, Punishment-Nothing, Reward and Punishment conditions are considered than LSES children (Spence and Dunton, 1967). MSES children tend to make more correct choices than LSES children on picture-object matching (Franklin, 1969). Cognitive styles of MSES children show more complex forms of construction than LSES children (Fowler and Burnett, 1967).

The most frequent of all types of manipulative organization observed in forty-month-old children is the manipulation of all eight objects used in the study. About 15 percent of the children manipulated the objects in a successive alternation sequence, a behavior virtually never observed in these children at age twenty months. At forty months there was a sharp rise in complete grouping of both sets of four objects, particularly with specific sorting instructions. There was a decline in the structuring of single groups as well as similar pairs. The grouping of four objects almost never occurred. A fair number of children grouped similar objects but did not instinctly separate them one from another more often under general than under specific instructions. Grouping of dissimilar objects or arrangements configurationally occurred almost exclusively at forty months. Symmetrical division was observed more often under specific sorting instructions. Grouping of dissimilar objects into four pairs and successive alternation were observed occasionally at forty months (never at twenty months) with more of the first. There was essentially no relationship between children's scores at twenty and forty months (Ricciuti and Johnson, 1963).

On a discrimination task matching geometric shapes up-down and left-right, children discriminate orientation of objects with a high degree of consistency. Up-down reversals give fewer errors than left-right reversals. Latencies are lower, as are errors, for high directional stimuli as compared to low directional stimuli (Wohlwill and Wiener, 1964). Color and size discrimination appears to be more difficult for sixes than for threes (Lee, 1965).

On conditional discrimination training tasks, few threes and fours attain criterion. Distributed practice during training facilitated both the training and conditional discrimination performance of four and one-halfs to fives but had little effect on three and one-halfs to fours. Training three and one-halfs to fours over a five-day period produced a downward trend in the number of errors over the successive days of practice, and almost everyone achieved success on the reversal task on the fifth day (Gollin, 1966). An irrelevant dimension or attribute interferes with the perception of the child under four in a learned size discrimination task. After four the proportion or percent of correct responses increases abruptly (Rosenberg and Birch, 1969).

Children who receive the major goal (reward) during the learning trials in an inferential behavior task and who could see the major goal during the test trial perform better than children for whom only one or neither of these conditions prevail (Kendler and Others, 1958). On discrimination learning tasks, fours (as well as sixes and eights) make many more errors on a reward problem than on a non-reward problem. None reached criterion during six sessions. Fours did not improve significantly over training sessions when compared to sixes and eights (Berman, Rane, and Bahow, 1970).

On a discrimination reversal task children benefited more from a mixed experience than from a positive, negative or no-reward reversal experience. The positive experience was superior to both the negative and no-reward experiences and no difference was noted between the latter two. Discrimination reversal is more difficult as trial length increases (Vaughter and Cross, 1965).

ADV children are better at matching pictures and arranging them spatially than DADV (Franklin, 1969). There is a progressive increase in age discrimination of photos by four year olds (Kogan, Stephens, and Shelton, 1961). Four year olds have great difficulty recognizing the Double Alternation sequence (Pufall and Furth, 1966).

Varying stimuli in discrimination learning is more difficult and distracting for fours than sevens. Fours' performance on the negative shift is slightly superior to performance on the positive shift for the control condition whereas the opposite is true for the experimental condition (Brown, L. 1969).

Fours use less relative cue preference than twos. They tend to shift choices after non-reward (Berman and Graham, 1964). Problem solving behaviors are more developed in an ADV prekindergarten group. An HSES child makes more use of the presence of adults in his problem solving (Banta, 1969).

Children whose parents participated in a course on the use of educational toys improved on the concepts the toys were designed to teach (Rayder, Alward, and Nimnicht, 1970). In the area of cognitive abilities, results of programs for Negro and Puerto Rican children favored conventional teaching in the public school and Montessori in the community center (Berger, 1970). Negro and Anglo threes could not master even the first and simplest learning sequence on the concepts of "fat" and "skinny" to criterion. Adding an extra example seemed to have a negative effect on learning (Greenfield, 1968).

In a study examining the concept of double function terms, threes and fours know double function terms only in relation to physical objects. In the few instances in which the terms are used to describe persons, the reference is most often to physical properties of persons. "Sweet" is the only word applied to persons in a sense other than physical. Several of the children were surprised and indignant at the suggestion that some of the terms could be used to describe persons (Asch and Nerlove, 1967).

Creative processes.--ADV children's representational play is somewhat more elaborated and differentiated than that of DADV children. They engage in more verbal descriptions of what they are doing (Franklin, 1969). Children whose teacher takes them step-by-step through the construction of specified objects exhibit superior criterion performance (product fulfilled assigned task). This treatment was especially pronounced with the youngest children (Bereiter, 1967). During training and extinction in puzzle completion the competence reward gap had a higher mean competent response rate than did the dependency reward gap (Speer, Briggs, and Gavalas, 1969).

Intelligence.--When verbal dependency to the experimenter is examined, average intelligence boys change from opposite sex orientation at age four to same sex orientation at age seven. Bright boys change from same sex orientation at age four to opposite sex orientation at age seven. Average girls remain slightly opposite sex oriented. Bright girls remain slightly opposite sex oriented. Average boys become more father oriented with age. Bright boys do not change their initial father orientation. Average girls (initially mother oriented) become more father oriented with age. Bright girls do not change their initial neutrality of choice (Kohlberg and Zigler, 1967).

Program posttests show significant gains on the PPVT and S-B for ADV children (Fowler and Burnett, 1967). MSES Negro, Anglo and Puerto Rican fours have a mean raw score on the PPVT only half a point lower than MSES fives in the same study. In terms of IQ this is a nine point difference in favor of the fours (Melton and Others, 1968). LSES children in an experimental treatment of nursery school experiences generally showed no significant raise in IQ when measured by the S-B, PPVT and Bender. Three dependent variables all favored the MSES group (Boressage, 1969). By the end of one year MSES children in an experimental program had nearly reached the level that was achieved by DADV after two years of instruction in reading and spelling. MSES did not have to be taught many of the subskills that had to be programmed for the DADV children, especially in reading (Bereiter and Engelmann, 1966). MSES children achieved higher IQ scores on three testing occasions (beginning and end of preschool year and end of first primary year) than LSES regardless of the program they were in (Lenrow, 1968).

In a study comparing programs, Montessori threes obtain higher total scores on tests measuring intelligence than traditional nursery school threes (Cox, 1969). After Head Start an experimental sample's IQ gain is fourteen points while the IQ of the contrast sample, composed of children whose family income is above the Head Start eligibility level remains stable (Fratto, 1968).

Language.--Increasing numbers of children use transformations at the older nursery school age. None of the young nursery school children use the transformations auxiliary have, reflexive, participal complement, iteration and nominalization. Some did use the reflexive and nominalization transformations eight months later. Decreasing numbers of the older children use restricted transformation forms. None of the older children use the additional restricted forms found in the young nursery school children's grammar such as the exclusion of the article (Menyuk, 1964). More nursery school children above the mean IQ use articles redundantly (Menyuk, 1963). There were no significant differences in the use of transformations between nursery school and kindergarten groups. More nursery school children use noun phrases redundantly, omit articles, omit restrictions in the use of the contraction, relative question and adjective transformations, omit or substitute forms in the third person present or past tense of verbs, and omit prepositions and articles in phrase structure (Menyuk, 1963; Menyuk, 1964).

At the youngest level 75 percent of the transformation restrictions not observed are contraction deletions. More children in the nursery school group could perform only the first steps in the following transformations: relative question, pronominalization and adjective. They could not bring the transformation to correct completion. They also omitted the irregular past forms of verbs and substituted regular past forms (Menyuk, 1963).

An almost equal percentage of preschool children learn and respond correctly to tasks requiring learning of both grammatical and ungrammatical sequences and reproducing grammatical and ungrammatical sets. Fewer preschool children than kindergarten children learn the grammatical sets. They also give more incorrect responses to grammatical sequences than do children at the second grade level. Mean response time for the nongrammatical material is greater than for grammatical material as is the percentage of correct responses between grammatical and nongrammatical sequences. None of the children were able to reproduce a nongrammatical set (Menyuk, 1968).

Sentence stress occurs much more frequently on contrasting picture description than on the initial picture. It occurs more frequently for subject and for verb than for object in the case of the contrasting picture; and when it does occur on the initial picture, it is for object and rarely for the verb (Hornby and Hass, 1970).

Threes and fours perform more adequately than fives when recalling a nonsense string of phonemes. As the string length increases for more complex language forms, MSES fours perform better than Head Start fives (Horowitz and Horowitz, 1967). Threes and fours make more errors repeating stimulus sentences containing difficult structure (adjective, relative pronoun, verbal auxilary, conjunction inversion) than in sentences containing easy structure (number, conjunction and complement forms), although both were of the same length. Responses to the difficult structures take longer. More of the inaccurate responses that are grammatically correct versions of the stimulus occur for the easy structures than for the difficult ones. The grammatical errors occurring are deletion, substitution, and addition of consonants or endings (Smith, C., 1966).

Fours give use definitions for a high percentage of the words they define (Wolman and Barker, 1965). The frequency of dramatic play questions increases with age. Children who talked more frequently in carrying out the roles of dramatic play were chosen more often as preferred playmates by their preschool peers than children who were observed to use dramatic play language less frequently (Marshall, 1961). When children attempt to explain judgments about conservation, they fail to verbalize scorable reasons. Anecdotal evidence suggests that limitations in their verbal repertoires influenced this result (Rosenthal and Zimmerman, no date).

Language styles of the ADV seem slightly more complex than those of the DADV. Interest in verbal explanations was secondary or minimal (Fowler and Burnett, 1967). A contrast sample of children whose family income was above the Head Start eligibility index had an average of thirty-four more words in their vocabulary than children in the Head Start sample. The vocabulary of the Head Start sample contained two-thirds of the words included in the vocabulary of the contrast sample (Fratto, 1968).

When final scores of children in a Montessori program and those in a conventional nursery school are compared, there are no differences in auditory discrimination and receptive language (Prendergast, 1964). In a study comparing programs, Montessori threes obtain higher scores on associative vocabulary than traditional nursery school threes (Cox, 1969).

The Academic Preschool children were better than Montessori children when auditory vocal association verbal versus nonverbal tests of the ITPA were compared (Bereiter, 1967). A Montessori group made greater gains between pre- and posttests in receptive language but final scores of the two groups were not significantly different (Prendergast, 1964).

Favored groups of English children use language five times as often as the less favored groups for extending or promoting action and for securing collaboration with others. They also use language almost three times as often to convey information to the listener which was not apparent from the concrete situation and more than twice as much speech for the promotion of imaginative play as the less favored groups (Tough, 1969).

Memory.--Fours cannot remember as long or as complete language forms as fives but threes and fours can perform more adequately than fives in recalling nonsense strings (Horowitz and Horowitz, 1967).

Mediational processes.--When stimuli and responses involved in pretraining and learning tasks differ, faster learning is found following pretraining with high frequencies as compared to low frequencies of reinforcement (Steigman and Stevenson, 1960). The performance of four and one-half year olds parallels the threes' performance on oddity-discrimination problems. Transfer to tasks that are two or more steps removed from the original occurs to threes and inter-problem transfer occurs for children after four and one-half (Saravo, Bagby, and Haskins, 1970). Nearly twice as many children can place an item correctly when it corresponds to the subject of the experimentor's instruction as when it is the object (Bem, 1970). Below four few children can verbalize the concept, transposition of middle size. Between four and five and one-half many children were found at all three levels of the concept. Transposition test responses of four and one-half to five and one-half year olds indicate that verbal mediation will facilitate transposition of the middle size response (Marshall, 1966). Fours have great difficulty in recognizing a Double Alternation sequence (Pufall and Furth, 1966).

Perceptual processes.--Children between the ages three and four show little accuracy in sameness-difference judgments but increases are found by ages five and six. Children between the ages three to six make cross-model sameness-difference judgments and recognition matches in which accuracy requires differential spatial positions (Abravanel, 1968). Perception of quantity increases between ages three and four. Three-dimensional stimuli elicit more correct responses than do two-dimensional stimuli. The number of incorrect responses does not vary according to the size of the stimulus and the numerical differences between two stimuli (Estes and Combs, 1966). Relative positive is a highly significant factor for sensory coordination of up-down figures and left-right positions (Huttenlocher, 1967). Upper MSES nursery school children identify like capital letters as easily as lower MSES kindergarten children. Capital letter pairs confused by children are M-N, M-W, S-P, I-J, H-A, K-X, B-X, H-X, N-X, I-L, P-R, A-X, and H-W (Blair and Ryckman, 1968).

MSES children receive higher total scores on spatial arrangement than LSES children. Representational orientation is widespread among children of both groups. The occurrence of representational activity as an inclusive or dominant mode of approaching the task situation is more prevalent among the MSES than LSES children (Franklin, 1969). When final scores of children in a Montessori program and those in a conventional nursery school are compared, there are no differences in figure-ground and position in space tasks (Prendergast, 1964).

General cognitive.--Anglo and Mexican American children increased their judgments of equivalence in the imitation and generalization phase from a position of no conservation in the baseline phase (Rosenthal and Zimmerman, no date). There are no social class differences in the ability to conserve numbers as measured by collapsing, rotation, expansion, equal addition, and unequal addition. Within this age a very small percentage of subjects actually conserve when both "same" and "more" are used in the questions (Rothenberg and Courtney, 1968). The number of children who can successfully place as many chips as the experimenter decreases as the number of chips increases (Sallee and Gray, 1963). Fours give more inconsistent nonconserving responses when five transformations--lateral displacement, collapsing, resub-grouping, equal addition and unequal addition--are compared (Rothenberg, 1969). Very few fours show comprehension of "same" or "different" using water in glass jars as the conservation medium (Hall and Others, 1970).

The mean number of correct responses under a verbal condition is greater than that under a pictorial condition in a class-inclusion experiment (Wohlwill, 1968). Young educable mentally retarded children are far behind their CA peers of average intelligence in knowledge and the sylloquism form of logical thought. Training results in a definite improvement (Ross, 1967).

Advantaged Anglo five-year-old children

Ability, specific.--Children who began a daily fifteen minute informal reading activity during the second semester of the kindergarten year were reading at an average grade level one year above other children (who had scored on the GPRA in kindergarten but were not in the reading program) by the end of first grade; one year one month at the end of grade two; six and one-half months at the end of grade three. Only 60 percent of the children who had MA's above six years six months when the project began learned to read in the project (Sutton, 1969). Negro and Anglo MSES kindergarteners do not differ from each other in the number of errors in learning to recognize six words. Children make fewer errors when given social reinforcement than when given either material reinforcement or just knowledge of the results (Pikulski, 1970).

The relationship between Bender reading achievement and reading readiness of kindergarten children is lower than Bender reading readiness and reading achievement scores (Smith and Keogh, 1962). Teachers' predictions of kindergarten children's ability correlated through fifth grade with their achievement. The Bender-Gestalt predictions generally did not (Keogh and Smith, 1969). Non-Puerto Rican white children from a MSES housing project are ranked higher by their kindergarten teachers than Negro and Puerto Rican children (Wolff and Stein, 1967).

There is a difference between Negro and Anglo scores on the MRRT but not between LSES and MSES groups (Scott, Nelson, and Dunbar, 1967).

MSES nursery school children show a consistent increase in ability to count as a function of CA with the oldest group able to count as high as 15.5 without error. Boys were able to count higher than girls. The remainder of the test involved generating number series, reversing a number series, watching object, enumeration ability, equality and inequality, ability to form groups, use numbers in a memory task and ability to detect missing numbers. There is a correlation of .88 between counting ability and the remainder of the test for the younger nursery school children and .79 for the older nursery school children (Pollio and Whitacre, 1970).

Concepts.--Fives are better able to order a set of pictures of persons by ages than younger children (Britton and Britton, 1969). Immediate verbal reinforcement leads to faster learning than delayed material rewards, which act as a distractor (Marshall, 1969). Negro and Anglo kindergarten children make fewer learning errors when given social reinforcement than when given either material reinforcement or just knowledge of the results (Pikulski, 1970).

Intelligence.--Only two of the ten subtests of the Piaget Tests of Thinking show more than one-third of kindergarten children at Stage III (thinking). Piaget measures' predictions are slightly higher than the

WISC at the kindergarten level (Dudek and Others, 1969).

Anglo girls appear to reason better than girls of other races (S-B, CPI) (Krider and Petsche, 1967). Anglo children outperformed Negro children on verbal and full scale measures of the WISC. In an age range of five to nine, there was a tendency for the younger Anglo children and the older Negro children to be fluent in response to the unusual uses test measuring divergent thinking ability (Iscoe and Pierce-Jones, 1964). The mean IQ for a group of children who began daily fifteen minute reading activities during the second semester of kindergarten was 115.5 in September of first grade compared to a mean IQ of 107 for all the children in the first grades in the program. Only children who scored on the GPRA began the kindergarten reading program (Sutton, 1969). HSES American and French Canadian children made similar IQ gains in an experimental kindergarten program (Pineault, 1967).

Language.--MSES Anglo children tested for their control of thirteen common syntactic structures give superior performances when compared with the performance of LSES Negroes, even when dialect differences are taken into consideration (Osser, 1968; Osser, Wang, and Zaid, 1969). In free samples the Anglo MSES subjects use proportionately more complex sentence structure (Osser, 1968). The mean word length of total language production increases with every advance in grade level when groups of kindergarten through eighth grade subjects respond to similar stimulus situations (Griffin, 1966). Garbles are common in the child's language. The kindergartener uses relative clauses and the subject-verb-predicate nominal type clause more than older children. T-unit length increases from kindergarten through first grade. Clausal patterns identified in kindergarteners were found only there, in third graders' writing, and in the speech and writing of seventh grade children (O'Domnell, Griffin, and Norris, 1967).

When children's identification and reproduction of w, r, and l are studied, more of the children observe speech-sound boundaries in an identification task than in a repetition task. Children above the mean age show a greater tendency to categorize the stimuli in a set as a single speech sound or to respond randomly. Only 42 percent of the children treated the sets of stimuli in the same manner in repetition and identification (Menyuk and Anderson, 1969).

General cognitive.--In a training program to teach concepts, rote counting, object counting, "same," "more," addition, subtraction, one-to-one correspondence, reversibility, and "more" or "longer," experimental children show an increase from pretest to posttest in contrast to control groups at both LSES (Negro) and MSES (Anglo) levels, with no social class difference at posttest. A replication study with different subjects and different examiners and three posttests found conservation of numbers fairly stable over time. MSES (Anglo) children showed more conservation responses in the control condition than the LSES (Negro) children. On the reasoning level test the result shows a general increase in adequate reasons and decrease of inadequate reasons from pretest to posttest for SES groups (Rothenberg and Orost, 1969).

Advantaged Negro five-year-old children

Ability, specific.--All of a Montessori group were ready to enter first grade as compared with only about 50 percent of this age group in a control group. Comparable percentages for children in public and parochial primary grades who had attended Montessori preschool were found to be superior to peers who had attended other preschools on teacher ratings of learning ability and interest in learning (Fleege, Black, and Rackaukas, 1969).

Concepts.--In a study of MSES and LSES Negro kindergarten boys all cognitive variables discriminate between the socioeconomic groups in favor of the MSES boys (Ryckman, 1967).

Creative processes.--Children who attended a Montessori preschool rate no higher on creative measures than children who attended non-Montessori preschools (Fleege, Black, and Rackaukas, 1969).

Language.--Negro children use a different highly structured language of their own patterned after the adult speech of their community (Baratz and Povick, 1968). In a study of MSES and LSES Negro kindergarten boys the MSES group scores well beyond the general language ability of the LSES group. Only 20 percent of the MSES boys fell below the median of the LSES boys (Ryckman, 1967). ADV Negroes produced a great many more words to describe pictures than ADV Anglos and DADV Negroes (Stern, 1966). A MSES control group with no preschool experience in September of first grade scored as well as a LSES group which had completed a year-round preschool center on the MRRT. On the MAT given in May the MSES control group scored higher on all subscales than any of the LSES experimental or control groups (Bittner, 1968). Children in a Montessori program made greater gains than those in a non-Montessori program in the area of verbal ability (Fleege, Black, and Rackaukas, 1969).

Advantaged five-year-old children with unidentified or mixed ethnic background

Ability, specific.--MSES children perform better than LSES children on reading readiness tests and on reading achievement tests: Gilmore Oral Reading Test, MRRT, Stanford Achievement Test. Children's home activities are not found to be correlated with either reading readiness or first grade reading achievement (Miller, W., 1969). On the MRRT ADV kindergarteners scored higher than the average, who scored higher than DADV (Hanson and Robinson, 1967). Measures of self-concept and ego strength taken at kindergarten level are predictive of reading achievement two and one-half years later (Wattenberg and Clifford, 1964). The MRRT and Gesell Developmental Readiness Test add little to the prediction of second grade reading achievement. Digit Span improves second grade reading predictions for the HSES group (Hirst, 1969). The kindergarten teacher's prediction of reading success survives as a predictor variable for the end of first and second grade reading success. There does not seem to be a relationship between the kindergarten teacher's prediction of the child's success in reading and his age (Hirst, 1970).

Another study found that home prereading experiences are definitely related to children's first grade reading achievement as measured by the Gilmore Oral Reading Test and Stanford Achievement Test. Experiences more prevalent among MSES than LSES were stories heard or books read to them by their parents, family trips, dramatizing stories, "pretending to read," and considerable contact with books. MSES and ULSES children were more able to interpret appropriate pictures than LLSES children. Most of the MSES children could rhyme words (Miller, W., 1969).

Educable mentally retarded children from HSES and LSES backgrounds show little difference in spelling and arithmetic. Those in an experimental program show reading scores approximately five months greater than their peers (Fouracre, Connor, and Goldberg, 1962).

Results of the Caldwell Preschool Inventory show no differences between groups of Head Start and non-Head Start Negro and Anglo children upon level of achievement (Krider and Petsche, 1967). A sub-first grade program stressing more structured readiness program and an informal kindergarten were equally effective in promoting reading readiness growth (Gabler, 1963). Test scores indicate there is a positive correlation for both younger and older kindergarten children between reading readiness achievement and kindergarten training. Before kindergarten training, maturation is the telling factor in determining reading readiness (Rosenthal, 1969). A summer readiness program before first grade does not produce differences in an experimental group when compared to a control group which is not in any program on the MRRT (Wingert, 1969). Scores on the Lee-Clark Readiness Test in first grade and California Achievement Test in second grade show no differences between children who attended kindergarten and those who did not (Fox and Powell, 1964). An experimental group using AAAS for reading readiness showed gains on the listening subtest, the alphabet subtest, the numbers subtest, the copying subtest and in overall gain on the MRRT. The control group had gains in the Word Meaning subtest, copy subtest and overall gain. Differences between groups favored the experimental group on the listening subtest, numbers subtest, and on total test scores and the control group on the word meaning subtest ([illegible] and [illegible], 1969). According to results obtained from the Caldwell Preschool Inventory, no significant differences existed between Head Start and non-Head Start children at the kindergarten level (Krider and Petrie, 1967).

Preschool children with a MA less than seven were taught to read in small group instruction using a phonic method. These children were able to generalize to standard print without formal training (Kjeldergaard and Frankenstein, 1966). Kindergarteners of DADV background do not differ from each other in number of errors in learning to recognize six words. The children make fewer errors when they are given social reinforcement than when given either material reinforcement or just knowledge of results ([illegible], 1970).

A small city-rural group was consistently the top performing group when compared with urban core area Head Start, non-Head Start, non-core area, and small city-rural Head Start groups. On the PPVT and ITPA this group had a fairly well-developed and even profile except for the high Auditory Decoding subtest. They also showed strength on size and number concepts (Hillery and Others, 1969). ADV children had higher mean scores on the PPVT, MRRT, and CPRT than culturally mixed groups or DADV children. The MRRT yielded the highest correlation with the CPRT and was the most important prediction test ([illegible], 1967). After receiving the Dalcroze treatment, an experimental group's post-test means on the Lee-Clark Reading Readiness Test do not differ from those of the control group (Stone and Pielstick, 1969).

DADV children representing top, middle and bottom scores on the MRRT were taught by a visiting teacher. All of the codes of the unit were recalled by 60 percent of the children and the remainder could identify two of the four codes. Most of the children acquired a new vocabulary and most recognized the arbitrariness of codes. Only 40 percent could answer a question concerning permanence of codes. Ninety percent could put pictures in a series to tell a story. The concept that the letter A was the symbol for a sound was not clear to the children (Lavin, 1966).

Concepts.--Age discrimination of photographs reaches a ceiling at age five with little further increase from age five to six. Children who are nondiscriminating or only partially able to discriminate for age are more likely to associate age with body size, while those who do discriminate use physiognomic cues (Kogan, Stephens, and Shelton, 1961). Considerably more hearing fives than deaf fives master the double alternation rules. Improvement in double alternation behavior increases with CA, with ages five and six appearing to be critical in acquisition and transfer, respectively ([illegible] and Furth, 1966).

Children are more successful with discrimination, seriation, and numeration of size differences with increases in the dimensionality of the materials in which those differences appear (Elkind, 1964). Children find it easier to learn to discriminate between the mirror image when they were placed in the skewed relative position than those in aligned relative position than in any other position. Up-down mirror images are easier to learn to discriminate between than left-right mirror images (Corballis, 1970). When children are asked to point to pictures or figures that had been pointed to by the experimenter and to do so in the same order, pictures are better retained than nonsense figures. The highest scores are obtained in the condition in which children are asked to recognize items when the same items were again presented (2-2 condition). The next highest scores occur in the condition in which the children had an option in that three of the nine objects were pointed out but only two items were asked for in the subsequent recognition testing (2-3 condition). The lowest scores occur in the condition in which the children are required to recognize three of the nine items (3-3 condition). In the 3-3 condition a definite improvement in scores occurs between CA five and CA six-seven on both pictures and nonsense materials; no change occurs on pictures in the 2-3 condition or on either material in the 2-2 condition. In the 2-2 condition primary tendency (child recognized first the item which had been presented first) is predominant at all ages (Ross and Youniss, 1969).

Fives give a greater number of Stage I responses and fewer Stage III responses. Stage I responses are those indicating that the partial class is greater than the total class while Stage III responses indicate that the whole is greater than either part (Elkind, 1961). The percentage of kindergarteners who could count by rote to or beyond 20, 15 and 10 was equal to the percentage who counted rationally. Twice as many of the oldest kindergarteners successfully counted to 20 compared to the youngest groups. Kindergarteners in the two oldest groups (older than 68 months) were higher in achievement on money, number, measurement and total score than kindergarteners in the two youngest groups (less than 62 months). Kindergarteners with nursery school experience differed from kindergarteners with either Head Start or no prior formal educational experience but generally not with day care children. Kindergarteners whose fathers had sixteen or more years of formal education scored higher on all of the subtests than those whose fathers had less education. This was also true for children whose mothers had sixteen or more years of education. In a majority of the subtests kindergarteners whose fathers were unemployed or on relief or whose fathers were unskilled workers scored higher than kindergarteners whose fathers were highly skilled workers or members of the classic professions. Those children whose fathers were highly skilled workers scored higher on numbers, geometry and total score than kindergarteners whose fathers were in the classic professions (Rea and Reys, 1970).

Children who used cuisinaire rods beginning in kindergarten scored higher on the MRRT numbers subtest than children who had not had this experience. The experimental children made either perfect scores or nearly perfect scores on tests administered in kindergarten and first grade (Daery, 1969). Nearly all of the children in a training program increased in their ability to identify six denominations of money or maintained a perfect score (Robison, 1964). MSES kindergarteners have a narrower range of correct responses on the Arithmetic-Concepts Inventory for Kindergarten and Entering First Grade than LSES kindergarteners (15 points as compared to 24 points). The MSES group's mean score is much higher than that of the LSES group (Montague, 1964). ADV fives scored higher than DADV on the Matching Familiar Figures Test, Children's Embedded Figures Test, Paired Associate Learning Task, and Reactive Object Curiosity Test except for subtests on number of contacts and number of manipulations (Mumbauer, 1969). HSES children learn discrimination tasks faster and make more correct responses than LSES children (Spence and Dunton, 1967).

Both the control group and the experimental group which used AAAS for reading readiness showed gains on the matching subtest of the (Ayers and Mason, 1969). Children who received reinforcers of confirmation plus trinkets for concept discrimination tasks did not produce differences on the time taken to complete program, errors, or pre- and posttest scores when compared to no trinkets (Alter, Eigen, and King, no date). Teachers of MSES children were more accurate in predicting the children's performance on matching words but less accurate in predicting performance on the letter-knowledge test than teachers of LSES children (Koppman and LaPray, 1969).

In a classification task Treatment I children who used pictures of familiar objects score higher than the control group on the Hierarchial Classification Test Form I. There is no difference between younger and older children on Form 1. On Form 2 of the HCT Treatment I and Treatment II (children with whom pictures of geometric designs were used) score higher than controls. Older children do score higher than younger subjects on Form 2 (Ward, R., 1969). There is no difference between children who come from a nursery school background and those who do not on items measuring concepts: naming geometric shapes, identifying shapes, counting buttons, writing numerals, counting numbers of a given set, identifying numerals, vocabulary, equivalence of sets, ordinal numbers, naming and identifying colors, matching geometric shapes and matching colors (Heard, 1970).

A battery of tests for Cognitive Skills was designed for a project studying Israeli children of differing cultural background. HSES Orientals and HSES Europeans were found to be better than LSES Orientals and LSES Europeans, respectively. Europeans were better than orientals in both HSES and LSES groups (Smilansky, 1964).

Creative processes. A study of home prereading activities shows that most MSES children had dramatized stories. Few had made up stories which they later used in their play (Miller, W., 1969).

Intelligence.--Kindergarteners above and below the mean IQ did not differ in the usage of all language structures. ADV scored higher than DADV on the S-B (Mumbauer, 1969). Kindergarteners who showed average or above average intelligence scores on the S-B and PPVT were given a criterion reading achievement test the following year in first grade. Variables found to contribute most to the prediction equation were perceptual quotient from the Frostig test, teachers' expectations, sex, social position and self-concept (Earhart, 1969).

Children from a preschool readiness program score higher on the PPVT upon entry into first grade than the MSES comparison group. The comparison group scores higher upon entry into second grade but not significantly so (Bittner, Rockwell, and Mathews, 1969). SES of kindergarteners is a predictor variable of second grade reading and arithmetic achievement, but not of first grade reading and arithmetic success. A teacher's check on a one-line scale from "little" to "very" successful appears to be a successful evaluation measure. Neither the use of the MET or WISC appears to be an appropriate approach to identification among kindergarteners' reading success through second grade. Intelligence scores add no predictive value for first and second grade reading achievement (Hirst, 1969).

In one study the higher SES group showed a five point IQ gain while the LSES group dropped three points for a mean overall gain of three points. In the comparison group the LSES's IQ held consistently while the higher SES group had a mean loss of two IQ points. M-P IQ does not differ from S-B IQ scores (Fouracre, Connor, and Goldberg, 1962). A HSES group shows an IQ gain of six points in an experimental program and a one point gain in a follow-up study (Fouracre, Connor, and Goldberg, 1962). S-B test scores indicate that there is no difference between the experimental group which completed the AAAS program and the control group which did not (Ayers and Mason, 1969).

American and French Canadian children who had been in kindergarten had higher mean IQ's than nonkindergarteners. The LSES group's mean IQ was higher than the HSES group's. The HSES experimental group experienced no significant gains. Size of family and children's IQ gains showed a negative correlation for the Canadian children, and a high correlation existed between birth order and IQ gains with the firstborn making the greatest gains. No correlations for either size of family or birth order was noted for the Americans (Pineault, 1967). Children from a more advantaged school district show higher intellectual potential than children from the LSES district (Irving, 1967). On WISC small city-rural group, an urban "non-core" group, and a small city-rural Head Start group exceed urban "core" children's performance by three or more standard score units. The small city-rural group is two standard score units above the urban "non-core" and the small city-rural Head Start group (Hillery and Others, 1969). MSES Puerto Rican, Negro and Anglo fives have a mean raw score on the PPVT only half a point higher than MSES fours in the same study. In terms of IQ this is a nine point difference in favor of the fours (Melton and Others, 1968).

After receiving the Delacato treatment the experimental posttest scores on the PPVT did not differ from those of the control group (Stone and Pielstick, 1969). Kindergarteners who had participated in Head Start were not significantly different from non-Head Start kindergarteners in intelligence (S-B), vocabulary and reasoning, but differences were found within each group in these areas. In the low average category of intelligence (IQ 80-89), the non-Head Start is favored on mean IQ and on MA. In the borderline defective category of intelligence (IQ 75-79), the Head Start children are favored on MA and on selected tests of comprehension. Both groups make high within group gains on all intellectual variables as evidenced by the differences between the means of the pretests and the posttests (Krider and Petsche, 1967). Average scores of MSES children on both verbal and non-verbal tests are almost identical (Stern, 1966). There are few significant relationships between the descriptive part-whole, descriptive (global) and relational-contextual approaches and the IQ as measured by the S-B (Siegel and Olmstead, no date).

Language.--There is a difference in the use of transformations by kindergarteners when compared with first graders but not when compared with nursery school children. More first graders use the transformation auxillary have and conjunction with the introductory segment if. More first graders than kindergarteners use noun phrases redundantly. Differences between nursery schoolers and kindergarteners and kindergarteners and first graders in the total number per sentence of the various restricted forms used were not significant (Menyuk, 1964). Structures restricted to a child's grammar such as third person singular and plural in the present tense of verbs, past tense of verbs, singular and plural nouns, and possessive pronouns and adjectives are used by varying numbers of children at the kindergarten level (Menyuk, 1963). Up to a point fives remember more and longer and complete language forms than do fours, though once past the five-phoneme length his performance drops so sharply as to be not much better than the threes. In a seven-phoneme complex language form, the five can recall approximately 60 percent in such a string and 30 percent of the elements in a random word string of like length. Fives do not recall nonsense strings as adequately as threes and fours. As the string length increases for more complex language forms, LSES fives' performance drops below the MSES fours' level as well (Horowitz and Horowitz, 1967).

Children five and one-half to six and one-half hold a conversation with another child more frequently than younger children (Marshall, 1961). The percentage of children at the kindergarten level who learned a set of materials and the percentage of correct responses was higher for nongrammatical sequences. This occurred only at this age level. A greater number of kindergarteners than preschoolers learned the grammatical sets, but more first and second graders than kindergarteners also learned the grammatical sets. There is a sharp rise in response time at the kindergarten level. The mean response time for the nongrammatical material was greater than for grammatical. The percentage of children repeating sets of words is higher at the kindergarten level than at any other grade level (Menyuk, 1968). When twenty kindergarten children were given randomly balanced pairs of high and low frequency nouns and adjectives and asked to choose the word card he wanted to keep, children showed a preference for higher rather than lower frequency words for both nouns and adjectives (Bereiter, 1967). English MSES children use more nouns at the head of the nominal group while working class children use more pronouns (Hawkins, 1969).

Memory.--Up to a point fives remember more, longer and complete language forms than do fours. Once past five-phoneme length, their performance drops sharply and is not much better than threes'. Fives do not perform as adequately as threes or fours in recalling nonsense strings. In a seven-phoneme complex language form, the five can recall approximately 60 percent in such a string and 30 percent of the elements in a random string of like length. Children were asked to point to pictures or figures of familiar objects, nonsense figures and geometric shapes in the same order in which the experimenter had pointed to them. Pictures were better retained than nonsense figures. Between CA five and CA six to seven both pictures and nonsense material showed improvement in the 3-3 condition (children required to recognize three out of nine items), only nonsense material in the 2-3 condition (three out of nine objects were pointed out but only two were asked for), and neither material in the 2-2 condition (children asked to recognize same items when they were presented again). Primary tendency prevailed at all ages (Ross and Youniss, 1969). There did not appear to be any difference in visual memory of objects between children who attended nursery school and those who did not (Heard, 1970).

Mediational processes.--Above age five few children lack knowledge of line length. Between four and five and one-half, children were found at all three levels of the concept, middle-size. Between ages four and one-half and five and one-half verbal mediation facilitates transposition of the middle-size response (Marshall, 1966). Torrance and Guilford and the MLCT were used to determine kindergarteners' scores on divergent thinking. Teachers rated children on five component traits of playfulness: physical, social, cognitive spontaneity, manifest joy and sense of humor. Playfulness correlated with the measure of divergent thinking (Leiberman, 1964).

Response speeds during pretraining in discrimination learning were found to be related to the reward condition on the immediately preceding trial rather than to the stimulus associated with immediate or delayed rewards. Pretraining had no effect on subsequent discrimination learning. Simultaneous presentation of stimuli during discrimination training resulted in faster learning and faster response speeds (Rieber, 1964). Two pre-experimental situations provided for 1) satiation and punishment for incorrect response and 2) satiation manipulated by varying the number of reward objects with the penalty for an incorrect response consisting of the subject's relinquishing a reward object. For children who did learn the task, there was a difference for penalty effect and satiation effect (Stevenson, Weir, and Zigler, 1959).

Perceptual processes.--Increase in accuracy in sameness-difference judgments are found by ages five and six. Children between the ages three and six made cross-model sameness-difference judgments and recognition matches in which accuracy required differential spatial positions (Abravanel, 1968). Lower MSES kindergarteners made about the same number of error scores as UMSES nursery school children on a task identifying "like" capital letters. Letter pairs most often confused are M-N, M-W, S-P, H-A, I-J, K-X, B-X, H-X, N-X, I-L, P-R, A-X and H-W (Blair and Ryckman, 1968). Children retain memory of pictures better than nonsense figures in the exact order which had been pointed to by the experimenter

(Ross and Youniss, 1969). Age, socioeconomic differences and sizes of cues are significant factors when ADV and DADV fives and sixes are compared using two-dimensional pictures as the stimuli ([illegible], 1969).

An urban "non-core area" group of children showed strength in Visual Decoding on the PPVT when compared to LSES groups. At the end of eighteen months they were two months below the norm on Visual Decoding and Visual Motor Association and three months below the norm on Auditory Discrimination. A small city-rural group of nonDADV had a high Auditory Decoding subtest score (Hillery and Others, 1969). The Bender-Gestalt given to kindergartens predicts both good and poor achievement at sixth grade (Keogh and Smith, 1967). Maternal nurturance is related to the child's tendency to match or imitate mother's behavior that is incidental or irrelevant to the task (Mussen and Parker, 1965). The development of cognitive style as measured by CEFT and HFT is stable from kindergarten through first grade (Dreyer, Nebelkopf, and Dreyer, 1969). Growth in auditory-visual integration is most rapid from kindergarten through second grade. Seventy percent of the kindergarteners scored four or less correct but by first grade only 30 percent received scores of four or less (Birch and Belmont, 1965). Both MSES and LSES children were able to discriminate between objects nearly the same size. Most of the MSES children could differentiate geometric figures. At least one-half of the children in the MSES group could accurately discriminate between b and d but few of the LSES could (Miller, 1969).

General cognitive.--Young fives perform no better than threes and fours on conservation of number tasks as the number of objects to be matched increases ([illegible] and Gray, 1963). More correct responses occur when "same" is used than when "more" is used in the question format.

MSES children made more consistent nonconserving responses than LSES children. Fives give more consistent conserving responses than younger children but fives are not consistent in conserving responses when five transformations--lateral displacement, collapsing, subgrouping, equal addition, and unequal addition--are used (Rothenberg, 1969). Candy produces more conservation responses than beans. The comparisons--doll-checkers, doll-car, and car-checkers--produced no better conservation performance. MSES females were found to be conservers more often than MSES males and LSES children (Baker and Sullivan, 1970).

Gagne's learning set analysis was used as a basis for teaching fives and sixes weight and length conservation. The experimental group showed an increase in substance conservation, weight, and length while the control group did not (Kingsley and Hall, 1967). In a class-inclusion task, the superiority of the verbal condition over the pictorial condition was consistent (Wohlwill, 1968). Two out of seven MSES fives did not meet class inclusion criteria (ability to deal with the concepts "more," "same," and "less" for conservation tasks (Blum, 1967). Both labeling classification and discrimination-memory training were successful in inducing conservation in kindergarteners. Only limited relationships were found between conserving and logical operations (Shantz and Siegel, 1967). A group of urban "non-core area" children did better than LSES groups in size and number skills and conservation of volume. Although they gained twelve months in a six-month period, they were still six months below the norm at the end of kindergarten. A small city-rural nonAFDC group showed strength on size and number in terms of gain scores and in conservation of quantity (Miller and Others, 1969).

Two children with a mean CA of five years four months were at Stage I on conservation of number. They were unable to make a set equivalent to the experimenter's set. Eighty-four children with a mean CA of five years nine months were at Stage II. They were able to make one-to-one correspondence with the experimenter but were unable to regroup the equivalent once the arrangement of objects within the set had been altered and tended to make inadequate or incorrect responses to one or more of the remaining test items. Nine children with a mean CA of five years and nine months could complete all the items on the test, placing them at Stage III. Posttest data reveals that the number of children in the experimental group is greater than the number of children in the control group at Stage III. At the end of the experimental program, 38.6 percent of the controls are at Stage III and 78.7 percent of the experimentals are conservers with sets of fourteen. With sets of twenty-four 38.3 percent and 74.2 percent are conservers. Stage placement seems more related to MA than to CA (Rea, 1968).

In a SEED school cross-sectional results on three conservation tasks show a maturational progression in which by second grade twice as many children manage all tasks correctly as in [illegible] schools. At kindergarten in the SEED school this would fall just under 10 percent. These results were confirmed in a related longitudinal study. Failure to probe using Piaget's clinical method on suspect answers resulted in apparent "regression" of responses to less mature levels at a later time, indicating that more probing earlier would have led to scoring the response differently. A third related investigation of the conception of "floating objects" asked children to give their ideas about what would or would not float. Trends with chronological age were similar to conservation studies (Riley, Chittenden, and Miller, 1966).

Advantaged Anglo children, mixed ages

Concepts.--MSES children show a preference for the higher probability alternative. Response latency means did not differ between SES levels (Silverman and Shapiro, 1970). In general, the lower the age of the person represented in a picture the more children ages three through six would place it correctly as the youngest. A very small percentage of the children managed to place all the pictures correctly (Britton and Britton, 1969).

Creative processes.--MSES children had a mean originality score higher than LSES using the Starkweather Originality Test (Starkweather and Cowell, 1969).

Advantaged Negro children, mixed ages

No studies.

Advantaged children with unidentified or mixed ethnic background, mixed ages

Attentional processes.--Pictures of animals and children were shown through two windows of a display apparatus. One picture stayed the same while the other changed on each trial. The response measure was the number of times the children chose the novel stimulus on the first block and last block of ten trials. Block 2 was chosen significantly more often than Block 1 (Cantor, Briggs, and Dick, 1969).

Ability, specific.--The higher SES level of one of several groups studied is accompanied by elevated initial scores on many of the variables under investigation as measured by the MRRT and ITPA (Rubin, 1969). A community pattern seems to exist among UMSES children in which acquisition of specific information is superior to integrated utilization of information (Berry, 1967). Early readers have largely higher mean IQ's than non-readers and are largely from HSES levels (Vlieto, 1968).

Concepts.--The best performance of children aged four to six on a discrimination task requiring placement of a marble in a hole occurred in the wrong uninformed condition, and the worst performance occurred in the wrong informed condition (Marshall, H., 1969). The effectiveness of the positive-negative-ambiguous reinforcement with fours and fives is related to their development level. Three pairs of verbal reinforcement were used: right-wrong, nothing-wrong, right-nothing. The nothing-wrong group performed better on the extinction series than the other groups, which means that "nothing" when paired with wrong acquired positive reinforcement value (Meyer and Seidman, 1961). On size discrimination, imitation, and construction tasks using blocks, slats and sticks for three, two and one dimensionality, respectively, children's ability increases with increase in dimensionality of the materials in which these differences appear. Differences between success on discrimination, imitation and construction tasks decreases with age because of incomplete conceptual ability of older children (ages four to six considered) (Olson, 1966).

There is a progressive change from nursery school age to third grade in the use of color concepts in construction of forms (Modreski and McDaniel, 1969). The total number of errors on concept utilization tasks decreases with age. Analytic and sex typed items produce the most errors while color and size produce the least. Color and size appear to be more difficult for six year olds than for threes (Lee, 1965). Irrelevant dimensions and attributes interfere with the perception of young children. Changed stimulus properties interfere with maintenance of a learned size discrimination in the majority of children under four (Rosenberg and Birch, 1969; Brown, L., 1969). Fours to sixes have the ability to match objects and collect small groups which share common features as well as understand some or all relationships and form exhaustive classes on the Piaget Tasks (Kofsky, 1966).

On two-choice discrimination tasks, color preferred twos through sixes make more errors under form relevant and vice-versa in the training phase. Individual children reverse more often on their preferred attribute independent of which attribute was preferred but more often where form was the training attribute. When three dimensional objects are used, children who prefer color tend to make non-reversal responses. Upper SES children tend to reverse their preferred attribute with planometric stimuli (Trabasso, Stave, and Eichberg, 1969).

While telling stories to fours and fives, an experimenter performed novel actions which she initially asked the children to imitate. They were reinforced for matching her actions. When new responses which were never prompted or reinforced were interspersed among reinforced responses, imitation again quickly developed. The model's nonperformance had an effect on response decrement. Noncontingent reinforcement tended to prolong imitation with boys. Imitation was unchanged with a new experimenter but did decrease when the activity context changed (Waxler and Yarrow, 1970).

Creative processes.--High, middle or low creative children as judged by scores on the Minnesota Tests of Creative Thinking do not differ on soci-emotional orientation. Parents of high creative children have less domestic value consensus and more role tension than parents of low creative children (Dreyer and Wells, 1966). A pre-treatment study on which an intervention program in Israel was based found these characteristics in ADV children's play behavior: most ADV children are at stage III or above (using miniature replicas as "props," undefined play objects, substituting verbal description for objects); verbalization serves three functions--imitation of adults, imaginative make-believe and management of play; ADV are "concept-and-word-minded"; the leader is difficult to spot and leads by virtue of his capacity to sustain projection of encompassing theme and ability to explain satisfactorily the logic of his opinions and actions; ADV children laugh with one another in the handling of problems or tensions; criticisms are not directly personal; they are a little overt in their aggressiveness; they plan their play verbally, i.e. "Let's pretend that...." ADV children identify with a role; a complex imaginative theme can be discerned in their sociodramatic play, and they are flexible in their use of props and setting (Smilansky, 1968).

Language.--When fours and fives are asked to hand an experimenter various blocks according to commands for particular colors and shapes, irrespective of connectives and idiom used, the distribution of responses for different commands is similar. Connectives influence the response. The most frequent intersection response is made to an intersection connective. The most frequent union response is made to a connective union. Responses to commands using negation are similar even though different idioms and different connectives are used. The first-mentioned set is give more frequently than the second-mentioned set (Suppes and Feldman, 1969).

House and road construction, animals that crawl and growl, doctor and nurse, trains, modern police, dramatic play and reality suggestion and agreement are the most frequent uses of language in two and one-half to five and one-half year olds' classroom play. Dramatic play use of suggestion and agreement increases as the age of the child increases while reality use of suggestion and agreement fails to change with age. Boys use dramatic play language more often than girls, but sex differences in the use of reality language either do not exist (suggestion) or were in the opposite direction (agreement). Imitation of the words and sounds of other children is not a frequent behavior. The children asked twice as many reality questions of other children and adults as dramatic play questions. The frequency of dramatic play questions increases with age. The vocabulary age of the child does not relate to his use of language and hostility with peers. The vocabulary age of a child correlates with three home sources of information--talk with father, talk with mother, and talk with other adults. Home experiences which relate to dramatic play topics also relate to the vocabulary age of boys (Marshall, 1961). Differences among language ages show that the total ITPA age is affected by cultural group but not by sex. Non-DADV children have higher language ages on Auditory Decoding, Visual Decoding, Auditory-Vocal Association, Vocal Encoding, Motor Encoding, Auditory-Vocal Automatic, Auditory-Vocal Sequencing, and Visual-Motor Sequencing. Non-DADV also used more words per utterance than did the DADV ([illegible] and [illegible], [illegible]).

The total reproduction of a set occurs very infrequently, but in all instances it is a grammatical set which is totally reproduced. More of the children reproduce a nongrammatical set. For the learning tasks there are no effects due to the grammaticality of the material in the percentage of children who learn the task or the percentage of correct responses at any age level (Menyuk, 1968). As age increases the percentage of use definitions of words tends to decrease (Wolman and Baker, 1965).

On the Personal Social Responsiveness section of the Caldwell Preschool Inventory the HSES group scored higher than the LSES groups. On the Auditory Vocal Association and Auditory Decoding subtest of the ITPA there are no differences between the SES groups. The HSES excelled on the Auditory-Vocal-Automatic subtest (Howard, Hoops, and McKinnon, 1970).

Memory.--An increase in age is related to recall scores on both words and lexemes. A decrease in recall or words for fives appears to be more a function of inaccurate word inflection (dropping word endings) rather than inability to recall sequential or syntactic organization or word sequences. MSES's show less improvement in recall of lexemes over that of words than LSES's. The MSES group's starting point, however, was near maximum level (Salzinger, Salzinger, and Hobson, 1967). Children's perceptibility of size differences are more pronounced on difficult tests than on easy tests (Elkind, 1964). Developmental trends in shape recognition from ages one to five are evident. Important cues for recognition of objects by children, particularly the younger ones, are those which afford information about the texture of objects rather than their shapes (Fisher, [illegible]). Threes through fives are able to make correct directional placements irrespective of their position with reference to the donkey (pin the tail on the donkey), whether they have or have not had previous experience with the donkey ([illegible] and Baker, [illegible]).

Mediational processes.--The performance on oddity discrimination problems indicate reliance on negative cues for the younger children and stronger positive tendencies for older children on the first task. Negative cue effects appear dominant by the end of training. Inter-problem transfer occurs for four and one-half to seven year olds (Saravo, Bagby, and Haskins, 1970).

Perceptual processes.--The high use of descriptive part-whole responses bears some significance to the speed of responses to a perceptual task. For boys high frequency of descriptive part-whole resposes reflect a slower perceptual approach, whereas for girls it reflecs a rapid one (Siegel and Olmstead, no date). A community pattern sems to exist in LMSES children in which auditory-vocal functions are suprior to visual-motor functions (Berry, 1967).

General cognitive.--On the water line task of Piagt most fours through nines perform better in the perception task than on the prediction task. On the distance conservation task a high IQ group obtains a higher score than a low IQ group (Ford, 1970). Children ages three through nine show no age difference on problem solving of wooden puzzles or repetition choice behavior. Boys prefer returning to th previously failed puzzle more frequently than do girls (Crandall and Rabson, 1960). As children increase in age the percentage of use definitions tends to decrease. Fours use 70 percent more by use definitions, eights use 43 percent, and twelves 15 percent (Wolman an Barker, 1965). Fours through nines have the ability to match objects, collect small groups which share common features, and understand some of all relationships and form exhaustive classes (Kofsky, 1966). The Piagetian operations of multiple classification, multiple attributes, seriation, and reversibility can be organized into an equilibrated methodology to facilitate the acquisition of the structure for the concept of conservation of quality by pre-kindergarten children (Baptiste, 1969).

Four of five members of an ADV group successfully solved a problem involving a tilted balance board. All of the ADV fives solved it and one ADV four who had also passed the conservation test. Four members of the ADV group also learned to work relative direction problems, mirror problems, and three-step non-center redirections (Englemann, 1967).

Descriptive part-whole responses are the most frequent for ages four and five followed in descending order by relational-contextual, categorical-inferential and descriptive-global responses, respectively. Girls show relatively more change than boys from age four to five (Siegel and Olmstead, no date).

Disadvantaged Anglo children under five years of age

Creative processes.--Low IQ Anglo preschool children score higher on divergent thinking measures than high IQ Anglo children ([illegible]).

Intelligence.--On the Columbia Mental Maturity Test, Anglo threes and fours have a higher score than Negro children (Stine, Saratsiotis, and Furno, 1967). There is a greater difference in IQ points of LSES fours than of MSES fours tested on the S-B (Williamson, [illegible], and Fiedler, 1970). A group of children with CA of two to four show an average IQ gain of nineteen points on the S-B and WISC. When only children with a normal EEG are considered the average IQ gain is twenty-three points (Kugel and Parsons, 1967). [illegible] control children show progressive retardation in capacity to learn a prekindergarten program was comparatively effective for Anglo DADV males only. They showed a mean gain of 1.9 IQ points while the remaining experimental and control subgroups experienced a mean IQ loss (DiLorenzo, 1967).

Language.--Anglo children demonstrate greater language ability in pretest comparisons with nonwhites (DiLorenzo, 1967).

Perceptual processes.--There is an increase with age of children's scores on perceptual tasks requiring object naming. An increase in mean scores occurs between sessions for fours and fives but not for threes (Gottschalk, Bryden, and Rabinovitch, 1964).

Disadvantaged Negro children under five years of age

Ability, specific.--The mother who reports that she prepared her child for the first day of preschool, presented models to him to imitate, placed restrictions on his friends and toys, planned to be an agent in his awareness of his own ethnicity, and talks consistently with the child about his own immediate experiences has the highest achieving Negro child in his early age group, whether or not she experiences herself as a potent force vis-a-vis the school (Slaughter, 1970). Chronological maturation and SRB pretest scores show a difference between age groups with a majority of the differences between Level I (36 to 48 months) and Level III (67 months and older) children on the following subtests: copying Arabic numerals, repeating number problems, the intelligibility rating on numbers and number problems, and the recognition of Arabic numerals (Ross and Hillgren, no date).

Children in an experimental preschool program score better on the California Achievement Tests on reading and arithmetic subtests at the end of first grade and maintain their superiority throughout second grade. None of the control group attain scores high enough to be ranked as an achiever (Weikart, 1967). Another program shows little difference between experimental and control groups on readiness tests (Alpern, 1966). Experimental children in WAVE I at third grade placed far ahead of controls on the California Achievement Tests with scores of [illegible] compared to [illegible]. The combined WAVEs for grades one to three show the experimental groups outperformed the controls at each grade level on the CAT (Perry Preschool Project, 1969). In a program applying the structure-process approach to inservice teacher education and compensatory programming, children show a marked increase on the Preschool Attainment Record for the Slosson Intelligence Test ([illegible], 1970).

A follow-up of children studied at age four reveals that measures obtained from mothers and children during the follow-up testing sessions and from the preschool phase of the study are more closely related to the aspects of cognitive development measured by standardized tests than to the teacher's operational definitions of cognitive (academic) achievement. Conduct and academic achievement were found to be different aspects of educability. Working class children receive lower grades and test scores than [illegible] children. Maternal control strategies or ability to teach effectively (as defined in the preschool phase) and affective behavior were related to academic grades and standardized test scores (Hess and others, 1969).

Concepts.--Negro [illegible] from working class homes appear hindered in the discrimination and labeling processes required for classification and show attitudes that are less reflective (Hess and Others, 1968). On tasks involving labeling, a structured preschool method seems more effective with DADV Negro fours who were at the low end of the distribution of language functioning before treatment (Dickie, 1968). Problem-solving behaviors are most poorly developed among non-prekindergarten LSES Negro children. Children from the LSES Negro ghetto or public housing settings who went to prekindergarten show gains on problem solving in a Montessori program but usually do not equal the USES groups. More advancement in analytic thinking prevails in the more orderly, structured Montessori classroom. LSES children make less use of adults in problem-solving (Banta, 1969). Children in four programs score higher on all measures of concept formation on the Reading Prognosis Test and Leiter International Performance Scale (Denmark and Guttentag, 1969). Mothers trained by mothers who were previously trained by professionals are the most effective in a home visitation intervention program when children are measured on the PPVT matching subtest (Barbrack and Horton, 1970).

Creative processes.--High IQ Negro children score higher on divergent thinking measures than low IQ Negro children (Savoca, 1965).

Intelligence.--LSES groups give lower predictions of scores they will attain than MSES groups. LSES children score lower than MSES on the S-B and Columbia Mental Maturity Test. Correlation within social class between maternal IQ and children's scores on the task show that IQ is most highly correlated at the lower ranges. It appears that the kind and extent of maternal control exercised over the child is more potent in determining the scores than were the strict cognitive maternal variables (Brophy and Others, 1965). At the end of the preschool program, the experimental group's IQ gain is higher than the control group's, but by the end of second grade the two groups are nearly equal and are out of the retarded range in which they were originally classified. Children rated as achievers on the California Achievement Tests maintain and improve their S-B performance while those rated non-achievers gradually return to their initial level (Weikart, 1967). Another program found no difference in intelligence between experimental and control groups (Alpern, 1966).

Children in an intervention program who attended three ten-week sessions and had weekly contacts with home visitors for the rest of the year (T_1) scored an IQ gain of nine points. A second group in the program who attended two ten-week sessions and had weekly contacts with home visitors (T_2) scored an IQ gain of five points. The T_2 group did not regress as much as the T_1 group after the program was completed. Two control groups (T_3 and T_4) showed an IQ loss. T_1 and T_2 groups surpassed T_3 and T_4 groups on the PPVT and on the ITPA with the exception of Motor Encoding (Gray and Klaus, 1964; Gray and Klaus, no date; Klaus and Gray, no date). There appears to be a direct relationship between children's IQ and MA scores on the S-B and their IQ and MA scores on the Leitner International Performance Test (Costello and Dickie, 1970). Negro children score lower than Anglo children on the Columbia Mental Maturity Test (Stine, Saratsiotis, and Furno, 1967). A six-year intervention program for DADV Negro children shows that after an initial spurt, experimental groups' scores on the S-B level off to become almost equal with the control groups' scores (Perry Preschool Project, 1969).

After two years in Howard University's "traditional" nursery school program DADV Negro children experienced an average IQ gain of 14.7 points compared to the control groups' gain of 4.1 points. Children from the middle and lowest SES quartile made more steady gradual gains. The highest and lowest quartile made the same average IQ gains. Children with the best attendance had the highest IQ gains at the beginning of the project but made less than average gains over the two year period (Kraft, Fuschillo, and Herzog, 1968). After three semesters in the Preschool Program children placed nine IQ points above children from the same neighborhood who had not attended preschool (The Preschool Program, 1969). DADV controls underwent progressive retardation in capacity to learn when compared with experimental groups. Prekindergarten treatment did not lessen the gap between ADV and DADV children but prevented the difference at age four from increasing by age five (DiLorenzo, 1967). In a program applying the structure-process approach to inservice teacher education and compensatory programming, fours show a marked increase on the Slossen Intelligence test but threes remain unchanged (Frost, 1970).

Language.--Negro fours show improvement on ITPA subtests in Visual Decoding, Motor Encoding, and Visual Motor Association (Anastasiow, Stedman, and Spaulding, 1970).

When the language of twos and threes is analyzed for parts of speech, adjective means are higher for the initially less advanced subjects on all six measures--sentence imitation test, mean length of utterance, noun phrase index, verb index, copula index, and sentence type index. Providing sentence models is a more effective treatment than expanding sentences produced by the children (Brown and Cazden, 1965). Parallel prompting fosters more sentence production than echoic prompting. Echoic change is less than modeling or mere listening in children who also do not differ from controls. Neither prompting method is greater than listening only (Stern and Keislar, 1969).

On Neurological Measures and SRE pretest and posttest scores, fours rate lower than fives on the intelligibility rating on words and sentences and retelling a story via pictures (Ozer and Milgram, no date). The only difference between treatment groups taught by a structured and nonstructured method appears on a task involving labeling. The structured method is more effective than the nonstructured method in producing gains in the children who are at the low end of the distribution of language functioning before treatment. The gains made by the children receiving the language training are greater than those made by children who did not attend preschool or who attended the same preschool earlier when a more traditional curriculum was used (Dickie, 1968). Receptive language improves with a prekindergarten program. Nonwhites differ from whites on pretest receptive language ability but show equal gains on posttest (DiLorenzo, 1967). Although nursery school children show gains on other tests, they are still over one year below norms in association language ability and in grammar and understanding meanings of words (Kraft, Fuschillo, and Herzog, 1968). Children who attended two or three ten-week sessions with weekly contacts with a home visitor score higher than controls with no school on all subtests of the ITPA except Motor Encoding (Gray and Klaus, 1964). Children in four different preschool programs score higher than control groups on verbal facility, auditory discrimination on the RPT and the Leiter International Performance Scale. Children in a concentrated two-month Head Start program emphasizing cognitive skills show the least gain in terms of verbal facility and auditory discrimination (Denmark and Guttentag, 1969). The mother's use of standard English was found to effect the child's performance to the same degree as her control strategies, teaching styles, and affective behavior (Hess and Others, 1969).

General Cognitive.--The materials used in conservation of number tasks show no effects or difference between preschool and kindergarten, LSES and MSES, and boys and girls. LSES fours make few correct responses and more inconsistent responses than MSES children. More correct responses were used when "same" rather than "more" was used in the question format (Rothenberg and Cowelney, 1968). Exploratory behavior measured in free-play sessions suggests that working class children are no less interested in complexity than MSES children (Hess and Others, 1969).

Disadvantaged children under five years of age with unidentified or mixed ethnic background

Attentional processes.--Montessori children are more able to settle down during testing and pay attention and comply with the task procedure than children in other groups (Berger, 1969).

Ability, specific.--Fours in an experimental program achieve a mean reading grade of 2.60 with a range of 1.6 to 3.7, a mean arithmetic grade of 2.51 with a range of 1.4 to 3.3, and a mean spelling grade of 1.87 with a range of 1.0 to 2.3 (Bereiter and Englemann, 1966). The progress of children taught by paraprofessional staff and those taught by professional staff shows little difference on the basis of the MRRT (Karnes, 1969). Children in full-year Head Start programs are superior to controls on total readiness and listening. Children in summer Head Start programs are not. By the end of the second and third grade both summer and full-year Head Start children do not score better than controls on the Stanford Achievement Test. Their scores approach the national level on school readiness at first grade ("Impact of Head Start," Westinghouse Report, 1970). Children in prekindergarten classes meeting a full year do better than ESEA classes which meet for five months. In other intervention programs, experimental children score higher on reading readiness than their controls (Gray and Klaus, 1965; DiLorenzo and Salter, 1968).

After two years in the Academic Preschool Negro and Anglo children who were four upon entrance into the program have a mean reading achievement score at grade 2.6 with a range of 1.6 to 3.7; a mean arithmetic score of grade 1.87 with a range of 1.4 to 3.3; and a mean spelling score at grade 1.87 with a range of 1.0 to 2.3 (Academic Preschool, 1969). In another two-year program children had a 1.7 reading level and a 2.6 arithmetic level at the end of kindergarten. At the end of one year another group had a 1.2 level in reading and a 1.0 in arithmetic (Osborn, no date). By the end of the preschool year, the achievement of fours was at beginning first grade in reading and beginning second grade in arithmetic (Bereiter, 1967). In one class of Durham Educational Improvement Program four-year-old boys, gains of approximately twenty months were made in the Motor Encoding subtest, approximately thirty months on the Visual Motor Association and twenty months on the Visual Decoding subtest of the ITPA. Their overall gain was fourteen months. Girls in the same class made a five month gain on Visual Decoding, an eight month gain on Motor Encoding, and an eleven month gain on Visual Motor Association (Anastasiow, Stedman, and Spaulding, no date). The cognitive ability of children in the Bereiter and Weikart programs improves in similar amounts (Seifert, 1969).

The setting of specific achievement goals did not prove effective except for one group of Israeli fours. Verbal control of performance was effective (Smilansky, 1966).

Concepts.--A group taught by a structured plan similar to operant conditioning used the color, shape and texture of the object in descriptions more than a group taught by units of work based on children's interests (Day, 1968).

Fours score lower than fives on Form 2 of the HCT (under SCS and under LSC) but not on Form 2 of the HCT (under CSC) (Ward, R., 1969). Children of a variety of backgrounds who speak a foreign language at home show a progressive increase in the average accomplishment per pupil per month by both CA and MA grouping. The difference is slight with the CA but shows a much sharper contrast by the MA class, especially for the youngest groups. The contrast is much greater between the accomplishment of children of MA's two and three than of children of corresponding CA's (Levy and Bartelme, 1966). LSES preschoolers tend to make fewer correct choices on picture-object matchings than MSES preschoolers. There is wide variation within each group, however (Franklin, 1969). There is a difference regarding concept development favoring a group without prekindergarten over a group with eight weeks prekindergarten and twenty-six weeks prekindergarten (Cobbs, 1968).

There is no difference between inductive and deductive treatments in Spanish surname fours acquiring the concept of adjectival comparatives (Bryson and Stern, 1969). On the ability to name colors all groups but one in the New Nursery School make gains from pretest to posttest (Nimnicht and Others, 1967). Problem solving behaviors are poorly developed on the average among the non-prekindergarten LSES group. More advancement in analytic thinking occurs in the Montessori classroom that is described as more orderly and more structured than in the Montessori classroom described as more flexible. LSES children miss many opportunities to take advantage of the presence of adults in contrast to MSES children, who make use of adults (Banta, 1969). Prekindergarten Head Start children compare favorably with beginning kindergarten children on a prekindergarten goal card except for identifying objects in nature and identification of color (Jacobs, 1967).

Creative processes.--On divergent thinking tasks the LSES groups score lower than HSES groups. Reward groups also score higher than non-reward groups (Savoca, 1965). Fours make more errors than fives with discerning the roundness, pointedness or squareness of an object and threes make the most errors (Clos and Serafica, 1967). When children in a high structured (traditional) program are compared with children in a low structured (creative) program, little difference is found on the Children's Individual Test of Creativity (Foster, 1967). LSES children in a Montessori prekindergarten program lack innovative behavior (Banta, 1969).

Intelligence.--DADV children in an experimental program achieve greater gains on the S-B than children in a comparison group. The experimental group shows a 17.4 IQ gain after the first year and an 8.61 IQ gain after the second year. The IQ range after the second year was 103 to 139 (Bereiter and Englemann, 1966). Of thirty-three children referred from Head Start, one-third are mentally deficient. The children have severe malnutrition and maternal deprivation (Comly and Hadjisky, 1967). Children in the lowest tenth percentile in the measurement of memotocrit are found to have twice the expected representation in the group of children below the tenth percentile on the Columbia Mental Maturities Test. Verbal maturity on the CMMT correlates with height in the upper end of the distribution but not in the lower (Stine, Saratsiotis, and Furno, 1969). An Ameliorative program for Negro and Anglo children shows average IQ gains of 21 points on the S-B. No child's gain is less than 5 IQ points and 80 percent of the children have gains of 15 or more points (Karnes, Hodgins, and Teska, 1969).

Children who attended nursery school have higher IQ scores than those who did not (Ziegler and Butterfield, 1968; Borosage, 1968). LSES children's PPVT results indicate that both fours and fives have an average IQ of approximately 72 (Melton and Others, 1968). A group of Appalachaian children's IQ scores on the PPVT are below the national average at ages three and four. Scores on the S-B are within the national norms (Hooper and Marshall, 1968). Children in the Juniper Gardens Parent Cooperative Nursery School Program had an average IQ gain of 23.5 points on a one year ten month increase in MA after one school year (The Juniper Gardens Parent Cooperative Nursery School Program, 1968). Various programs for threes and fours show experimental groups' IQ scores are higher than those of controls or comparison groups (Herbschman, 1967; DiLorenzo, 1967; Academic Preschool, 1969; DiLorenzo, 1968; Borosage, 1968; Blank and Solomon, 1968; Karnes and Others, 1968; Levenstein, 1970; Gray and Klaus, 1965; Osborn, no date). The pattern for the low gainers in an experimental program is one of social and cognitive immaturity and relatively frequent negative affective tone expressed by an absence of active happiness in the sessions (Levenstein, 1969). Prekindergarten treatment does not lessen the gap between ADV and DADV children but does prevent the difference at age four from increasing by age five (DiLorenzo, 1967; DiLorenzo, 1968). In a program for DADV children ages six months to five years, threes and fours show the most dramatic rate of increase in IQ on the Cattell or S-B (Caldwell and Richmond, 1967). DADV fours gain on the Columbia Mental Maturity Scale and PPVT but not on the S-B while ADV children show gains on all three (Fowler and Burnett, 1967). IQ increases fourteen points as a consequence of Head Start while the contrast sample remains rather stable (Fratto, 1968). On the ITPA Head Starters in summer programs only do not score higher than controls at each of three grade levels. Children in full year Head Start score higher than controls only on Visual Sequence Memory and Manual Expression and only then at second grade level ("Impact of Head Start," Westinghouse Report, 1970). Comparison of progress of children taught by paraprofessional staff and by professional staff on the basis of S-B and ITPA show no difference (Karnes, 1969). There is no difference for threes and fours between pretest and posttest on the S-B and PPVT, but there is a consistent pattern of rise in scores on the Preschool Inventory from first year threes to first year fours to second year fours (Nimnicht and Others, 1967). Performance on the S-B, PPVT and Bender-Gestalt favors MSES children over LSES children (Borosage, 1968). The most effective programs as measured by scores on the S-B are those with the most specific and structured cognitive activities (DiLorenzo and Salter, 1968). Within an experimental group there is a wide range in the cognitive gains of the children (Levenstein, 1970). In the Early Childhood Project, posttests show that in some waves experimentals score highest on the S-B and Columbia Mental Maturity and in some waves controls do (Early Childhood Project, 1969). Ameliorative and Direct Verbal programs produce the greatest IQ gains of five intervention programs (Karnes, Hodgins, and Teska, 1969). Children in both a highly structured traditional program and a low structured, creative program make IQ gains on the S-B (Foster, 1967). Mexican American children in a bicultural school score higher on the WISC than their control group and a Head Start group

(Henderson, Rankin, and Frobisker, 1969). Children whose classroom participation was supplemented with a weekly visit by a professional who involved the mother in the educational process show consistent gain on all ITPA subtests approaching or exceeding the national level (McCarthy, 1968).

Language.--Children in a second group who were not visited at home but whose parents participated in group meetings closely approximate the national mean in total ITPA score. The group whose parents received no guidance shows an overall deficit (McCarthy, 1968). High gainers in an experimental program are characterized by clusters of positive factors in verbal interaction and positive effect while the pattern for low gainers is one of social and cognitive immaturity (Levenstein, 1970). After seven months of a preschool educational program children in the experimental group did not have higher scores than the controls on the ITPA, PPVT and Vance Language Skills Test (Vance, 1967; Vance, 1968). Fours in the Durham EIP program make gains on the ITPA subtests on Motor Encoding, Visual Motor Association, and Visual Decoding with boys making substantially higher gains than the girls (Anastasiow, Stedman, and Spaulding, no date).

Children in an Ameliorative program fell within normative range by the second test on the ITPA (Karnes, Hodgins, and Teska, 1969). Neurological measures and SRE pretest and posttest scores show a difference between age groups with a majority of the difference between Level I (54 to 60 months) and Level II (67 months up) children on the intelligibility rating on word sentences and retelling the story via pictures. Individual tests show a change for subtests measuring the ability to repeat intelligibly words and sentences, the ability to comprehend verbal terms, and the ability to recall and retell a story in a connected fashion (Ozer and Milgram, no date). When grammatical usage was taught in an experimental program, scores rose dramatically on the Auditory-Vocal Automatic of ITPA but when instruction was terminated, improvement ceased. At first testing, only three children were at or above age level on vocal encoding but three months later, seven were at or above age level (Bereiter, 1967). On the verbal section of the WISC the mean gain of Mexican American children in a bicultural preschool is higher than the control group but not higher than the Head Start group (Henderson, Rankin, and Frobisker, 1969). Although there was initially no psycholinguistic differences between experimental and control groups, after they participated in the program the experimental children scored two months greater than their CA while the controls scored eight months less than their CA (Karnes and Others, 1968). On test one none of the fifteen children in an Ameliorative program for Negro and Anglo children were able to perform on all four subtests of the ITPA. On two additional subtests, nine children scored below norms. At test two, with the exception of Auditory-Vocal Automatic, all but one or two of the children fell within normative range (Karnes, Hodgins, and Teska, 1969). Fours make more progress than threes in a one year Ameliorative program on the ITPA subtests Audio-Visual Automatic and Motor Encoding. The performance of children who began at age three and continue at age four is not superior to those who began at age four (Karnes, 1969). There is a difference in the total number of words or phrases used between a group taught by a structured plan similar to operant conditioning and a plan based on children's interest. There is no difference on total language production. The latter group is more apt to describe objects by function or use than the former group. The first group produces more concept words than the latter. All of the children make many more kinds of responses in which they name a part of each object than they make relational, contextual or categorical responses (Day, 1968). Appalachaian three and one-half year olds' scores on the ITPA are not different from national norms. On 30 percent of the comparisons, they exceed the national norms. Only the Auditory-Vocal Association subtest reveals a clear-cut age progression (Hooper and Marshall, 1968).

A toy demonstrator modeled verbal interaction with the child in his home. The children in the program had a mean PPVT gain of 12.2 compared to control group I's loss of four points and control group II's gain of 4.7 points (Levenstein, 1970). In some programs mean scores on language skills of the PPVT and VLST favor the controls over the experimental group (Vance, 1967). Pretest results indicate that the vocabulary of a Head Start sample contains two-thirds of the words in the vocabulary of a contrast sample whose family income was above the Head Start Index. After Head Start treatment the experimental group demonstrated a growth in the number of words in its vocabulary as well as a reduction in vocabulary differences. Children in a prekindergarten program improve in receptive language. The experimental group's gain is well beyond the maturational gain of the controls (DiLorenzo, 1967; DiLorenzo, 1968). Children in five groups demonstrate major initial deficits in language. Children in Ameliorative, traditional and Direct Verbal programs progress eight to twelve months on Vocal Encoding while the Community Integrated and Montessori groups obtained lower scores on posttest than on the pretest. The Ameliorative group made the greatest progress on the Auditory Vocal subtest, and the Montessori group regressed. On the Auditory Vocal Association only the Direct Verbal and Ameliorative groups were not deficient (Karnes, Hodgins, and Teska, 1969). The language styles of the DADV subjects seem less complex than the ADV. Their interest in verbal explanations is secondary or minimal (Fowler and Burnett, 1967). Appalachian three and one-halfs perform exceptionally well on the ITPA. Only the Auditory Vocal Association subtest reveals a clear cut age progression from three and one-half to four and one-half. The three and one-half year old sample does not differ from the national norm (Hooper and Marshall, 1968).

Perceptual processes.--The effect of training on visual perception is a great deal more salient at the end of the second year than at the end of the first year of school (Berger, 1969). LSES children receive lower total scores than MSES children on spatial arrangement. There is a tendency to assume that a representational orientation is widespread among children of both groups. The occurrence of representational activity as an exclusive or dominant mode of approaching the task situation is less prevalent among the LSES than the MSES (Franklin, 1969).

General cognitive.--On transposition tasks, initial discrimination was more difficult for twos than for threes. The incidence of relative responses on tests in the negative direction is greater than the incidence on tests in the positive direction (Rudel, 1958). No SES difference is found in the ability of twos, threes and fours to conserve numbers as measured by collapsing, rotation, expansion, equal addition, and unequal addition. Within each age a very small percentage of subjects can actually be designated as conservers when both "same" and "more" are used in the questions or either (Rothenberg and Courtney, 1968). A comparison of the Weikart and Bereiter programs shows that general cognitive ability of pupils in these programs improves in similar amounts (Seifert, 1969). None of the DADV under fives could solve a criterion problem involving a tilted balance board (Englemann, 1967).

Disadvantaged Anglo five-year-old children

Ability, specific.--There is a difference between Negro and Anglo scores on the MRRT but not between LSES and MSES groups (Scott, Nelson, and Dunbar, 1967). After a six-week Montessori Head Start program, Anglos were at grade level in reading and arithmetic (Johnson, 1965).

Concepts.--Immediate verbal reinforcement leads to faster learning than delayed material reward. Material reward acts as a distractor. Delayed verbal reinforcement is detrimental to LSES children (Marshall, 1969).

Intelligence.--The initial PPVT means of the Indiana Diagnostically Based Curriculum were lower than the Perry Preschool Project, but at the end of one year of the experimental program the Indiana mean was 95.5 compared to the Perry mean of 74.7 (Hodges and Spicker, 1967). The experimental groups in the Indiana Diagnostically Based Curriculum have a combined mean on intelligence measures that is greater than either the comparison kindergarten group or the controls who remained at home during the kindergarten year. The experimental and kindergarten groups' IQ scores seem to stabilize but the "At Home" group show IQ gains in first grade of such magnitude to cancel out the difference which formerly existed between the three groups (Hodges, Spicker, and McCandless, 1969). Other programs report significant gains in IQ during one or two years in a preschool program. Some IQ gains are enough to place children in regular public school rather than mentally retarded classes (Roll, 1962; Kugel and Parsons, 1967).

Language.--Pretest results indicate that the vocabulary of an experimental Head Start sample contains two-thirds of the words included in the vocabulary of the contrast group. The experimental sample demonstrates a growth in the number of words in its vocabulary as well as a reduction in vocabulary difficulty as a result of the Head Start program. After a seven-month interval in which neither group was subjected to special treatment except for being together in a kindergarten program, each group earned the same proportional word increases as were made subsequent to Head Start (Fratto, 1968).

Intervention experiences are more effective for language development than for intelligence development. Pretests indicate that the experimental group is highly retarded in language. In the period following the intervention treatment the experimental group exhibits decelerated progress while the kindergarten control group maintains progress and the "At Home" control group shows accelerated progress (Hodges, Spicker, and McCandless, 1969). During the school year from pretest to posttest, increases in total language age for the experimental group exceeded the increase in total language of the kindergarten control group and the "At Home" control group (Stearns, 1967). The rate of language development for all groups during first grade is less than one-half that made during the previous year (Hodges and Spicker, 1967).

Memory.--Increase in age is positively related to an increase in recall scores. A decrease in recall of words for older fives appears more to be a function of inaccurate word inflection rather than inability to recall sequential or syntactical organization or word sequences. LSES children showed a more marked improvement in recall of lexemes over that of words and on imitation of nonverbal sequences than the MSES children; but the MSES children were near the maximum level to begin with (Salzinger, Salzinger, and Hobsen, 1967).

Perceptual processes.--Mean scores in object naming increase with age. A high increase in mean score occurred between sessions for fours and fives but not for threes (Gottschalk, Bryden, and Rabinovetch, 1964).

Disadvantaged Negro five-year-old children

Ability, specific.--The Negro mother who reports that she prepares her child for the first day of preschool, presents models to him to imitate, places restrictions on his friends and toys, plans to be an agent in his awareness of his own ethnicity, and talks consistently to the child about his own immediate experience has the higher achieving black child in his early age group, whether she experiences herself as a potent force vis-a-vis the school or not (Slaughtor, 1970). There is a difference between Negro and Anglo children using seriation scores as a criterion but there is no difference between the LSES and MSES using the same criterion (Scott, Nelson, and Dunbar, 1967). In an all Negro school, the top 30 percent of the strands hold 33 percent of the Head Start children and 26 percent of the non-Head Start children. Eighteen percent of the Head Start children and 42 percent of the non-Head Start children were found in the bottom 30 percent of the class (Wolff and Stein, 1967).

At the end of first grade twenty-one grade equivalent comparisons were made and all favored the children who had attended kindergarten over those who had not. At the end of second grade the kindergarten group still was favored in nine of fourteen comparisons. When the children who had had kindergarten are compared by reading approaches used in first grade, the Language Experience Approach is favored over the Skills Centered Approach (Morrison and Harris, 1968).

In a program applying the structure-process approach to inservice teacher education and compensatory programming, fives show a gain on the Preschool Attainment Record (Frost, 1970). There is no difference in reading or arithmetic on the MRRT between children in a nine-month preschool, a summer preschool experience, and no preschool (Pitts, 1967). Children from slum housing receive higher test means on the preschool inventory test than those in public housing. Head Start children exhibit greater growth and development. Without Head Start the public housing groups were superior; with Head Start greater changes were produced among those children from the slum area (Rice, 1969). In a reanalysis of Head Start data on urban black centers, it is found that Head Start raised the group average on the MRRT 16 percentile points from the 32nd to the 48th percentile (Smith and Bissell, 1970).

A trend of accumulative deficit is evident in experimentals and controls in reading achievement. Virtually all meaningful ability achievement differences measuring experimentals who had kindergarten and controls who did not disappeared shortly after entrance into traditional primary school programs (Weisbender, 1969). Summer Head Start programs generally show no difference in reading readiness between children who participate and those who do not (Hyman and Kliman, 1967). Negro children are less often interested in only one or two objects or activities than the Anglo child. Negroes are more skillful at tasks demanding physical coordination (Kohlewes, 1966).

Concepts.--There is a difference between Negro and Anglo children using seriation scores as a criterion, but there is no difference between the LSES and MSES groups using the same criterion (Scott, Nelson, and Dunbar, 1967). Children given training in relevant verbal language did not perform significantly better on posttest than the children who were not given labeling training. There were a greater number of correct responses on those items where either of the extremes of a stimulus dimension was correct as compared with items where the medium sized stimulus was correct (McNeany and Keislar, 1966). In a study of MSES and LSES Negro boys, eighteen cognitive variables discriminated between socioeconomic groups in favor of the MSES boys (Ryckman, 1967). Children in a treatment group which used picture books chemically treated to provide feedback for both correct and incorrect responses give superior performance to other treatment groups on a transfer task (Stern and Teager, 1968). Differences in scores between the first and second administrations of a test show that kindergarten children can understand the earth as a globe (Portugaly, 1968). Classification training does enhance the child's ability to employ grouping and scorable responses, as well as increase the variety of criteria by which to classify (Sigel and Olmsted, 1967).

Creative processes.--Children with preschool scored higher than controls without preschool on Quick Picture Vocabulary Test on Creativity (Weisbender, 1969).

Intelligence.--Negro children improve on the ITPA in Visual Decoding, Motor Encoding, and Visual-Motor Association (Anastasiow, Stedman, and

Spaulding, 1970). Original preschool Binet posttest favors experimental groups (preschool experience) over controls (no preschool experience) (Weisbender, 1969). In a Head Start group that is 90 percent Negro, performance on memory for designs and on Visual-Motor Association are the only two areas in which performance approximates CA. Performance is above MA on seven measures (Cawley, Burrow, and Goodstein, 1968). In a program applying the structure process approach to inservice teacher education and compensatory programming, fives remain unchanged on the Preschool Attainment Record (Frost, 1970).

Language.--LSES Negroes are not functioning at an underdeveloped or retarded level of syntactic development. They use a different highly structured language of their own (Baratz and Povick, 1968). Of eight children who performed below CA on pretest, six show linguistic improvement on a posttest of the ITPA after structured and unstructured language situations. Most of their speech patterns exist in the form of fragmenting expressive phrases or simple sentences. Most expressive patterns of the children show an omission of verbs and infinitives which is generally common to the dialect of the children (Hernigan, 1968).

Negro mother-child pairs appear more passive in the home than in the school setting. Puerto Rican mother-child pairs were twice as active as the Negro group in verbal and non-verbal forms of communication that encouraged exploratory behavior and learning. The Negro group was more active in the use of verbal admonitions and "don't" in critical comment. in directing and coercing verbal and non-verbal communications (Weissman, 1967).

When compared to a group of Anglo MSES children, the Negro LSES children were substantially below in development of the range of syntactic structures tested. There were large differences on the three indices of linguistic performance within the Negro group (Osser, 1966).

After five months of an enriched kindergarten environment with specific and intense instruction in perception, language, and concept development, the kindergarteners scored higher than a group of first graders on seven of ten subtests of the ITPA (Cowles and Daniel, 1970). Children given training in relevant verbal labeling did not perform significantly better on the PPVT posttest than the children who were not given labeling training. It appears that many of the children in the labeling group were vocalizing while children in the non-labeling group, who were not instructed to label, never spoke audibly (McNeany and Keislar, 1966). LSES Negro children show increased verbalization in the classroom after classification training taught through guided discovery (Sigel and Olmsted, 1967). Comparisons of first grade children who had received one year of kindergarten experience with first graders who had no kindergarten experience yielded significant differences on six of the ten subtest scores of the ITPA. Subtests with no difference were Auditory Reception, Grammatical Closure, Auditory Memory, and Visual Memory. The non-kindergarten first graders showed deficits while the first graders with kindergarten scored within average range on six of the ten subtests (Cowles and Others, 1970).

DADV Anglos and ADV Negroes produce "a great many more" words to describe pictures than ADV Anglos and DADV Negroes. DADV Negro and ADV Anglo are similar in part-of-speech usage, using 60 percent nouns, few pronouns, adverbs, adjectives and prepositions, and a much higher proportion of verbs than the other two groups (Stern, 1966). Negro Head Start participants' language deficits seem to lie in areas of language output and in items where stimuli are organized and sequenced in the response pattern

(Cawley, Burrow, and Goodstein, 1968).

Two treatment groups were higher than the control group on all subtests. Treatment I was the oral group in which the children gave verbal reasons for choices of appropriate answers to the problem. The second treatment group did not give oral answers. The oral and non-oral groups did not differ on any of the subtests. In Phase II the same treatments were used to develop specific concepts of nature study. The oral group had higher scores. Phase III involved deductive learning with "and," "or" and "not." Children were given a rule and expected to apply it. The oral and non-oral groups again were superior to the controls (Keislar and Stern, 1969).

General language ability has the highest correlation with SES. Only 16 percent of the LSES boys exceeded the median of the MSES boys and only 20 percent of the MSES boys fell below the LSES (Ryckman, 1967).

Mediational processes.--Phase III of an experimental program involves deductive learning with "and," "or" and "not." The children are given a rule and expected to apply it. Both the oral and non-oral groups are superior to controls on posttest (Keislar and Stern, 1969).

Perceptual processes.--There is considerably more overlap between LSES boys and MSES boys on visual imagery and visual classification (Ryckman, 1967). Negro children are superior in sensory perception to Anglos and Orientals (Kohlewes, 1966). DADV Negroes in Head Start show rapid and marked improvement (about 25 percent error reduction) over an eight to ten week period in their recognition of geometric forms and irregular shapes that are tachistoscopically presented. This change in accuracy is unaffected by specific training. Accuracy of perception is positively related to S-B IQ (.63) and with the developmental scale of the Preschool Inventory (.68) (Gotts, 1967).

General cognitive.--In a training program consisting of twelve to twenty minutes to teach concepts, rote counting, object counting, "same," "more," addition, subtraction, one-to-one correspondence, reversibility, "more," or "longer," there is no SES difference at posttest in three experimental groups. Both LSES and MSES groups improve from pretest to posttest. Both SES groups increase consumption responses from pretest to posttest. MSES children show more conservation responses in the control condition than the LSES children (Rothenberg and Orost, 1969). No increases in conservation are found across mass-conservation tasks using plasticine, but a significant increase is found across number tasks using M and M candies. Perceptual supports are more effective for older children and sensorimotor supports for younger children (ages five to six and one-half considered) (Whiteman and Peisach, 1970).

Disadvantaged five-year-old children with unidentified or mixed ethnic background

Attentional processes.--DADV children are more impulsive in response disposition. They do not inhibit their motor responses less upon verbal request or manifest less object curiosity than ADV children (Mumbauer, 1969). Fives are more attentive on program segments A and B of an educational television study. MSES children's attention level is higher than Mexican American LSES fives on all segments of programming. During five programs one of three children look at television, while during cartoons all children look at television. When CA is partialled out of the analysis, PPVT has no correlation with attentional processes (Palmer and Others, 1968).

Ability, specific.--In one program various assessment indices point out that the Head Start program strengthened the children's emotional stability and task-oriented interactions with adults and their work orientation (Michigan Head Start Evaluation and Research Program, 1968). No progress is reported for Israeli children who learned general instructions only for two scholastic tasks. Verbal control of performance is effective with both letter and word and picture tasks (Smilansky, 1966). Between summer Head Start and non-Head Start children tested at the kindergarten level, there are no differences in achievement level (Krider and Petsche, 1967).

After a six-week summer Montessori Head Start program, Anglo children were better than Mexican American in reading and arithmetic readiness. Anglos were at grade level while Mexican Americans were at a pre-reading stage (Johnson, 1965). Fours and fives attending the child-care language enrichment programs show no superiority on reading readiness or reading achievement when compared to other similar childcare children (Oakland Interagency, 1964). Children who previously attended a Rural Child Care Project Center for a minimum of sixty days do not perform better than a matched group on the California Achievement Test. Both groups are one to six months below national norms (Briscoe and Archambo, 1969). In general, the words children ask for using Ashton-Warner's Key Vocabulary for the Disadvantaged differ from the word lists and words used in the major basal series primers and preprimers. There is a similarity between the words pupils ask for and the words in their basal readers only in the Jacksonville, Florida Center (Packer, 1970).

Fives who were in an experimental preschool scored no higher than a kindergarten contrast group and an "At Home" group when measured either on informal criteria or academic criteria at later testing in grade school (Hodges, Spicker, and McCandless, 1967). After Head Start programs Head Start children tend to be ranked high in their kindergaeten classes in greater proportions than children who had not had Head Start after six months of kindergarten and appeared less frequently in the bottom three deciles of the class than non-Head Start children. Teachers who had fewer than 25 percent Head Start children in their classes thought that Head Start had made no difference. Where Head Start children made up 50 percent or more of the class the teachers all thought Head Start had helped the child's initial adjustment (Wolff and Stein, 1967). Head Start children scored higher at the end of an eight-week summer session than non-Head Start children tested at the end of eight weeks of first grade although the non-Head Start children were older at the time of testing than the Head Starters were (Pierce-Jones and Others, 1966).

Children of LSES background benefit from intensified structured activities involving oral language (Irving, 1967). For children with PPVT scores below 104, "Rule-example" is the best instruction method (Anastasiow and Others, 1970). A phonetic approach to the teaching of reading does not seem to be applicable to children in a Mississippi Head Start program (Gordon, 1966). By the end of the kindergarten year of a two-year program, the children's mean achievement was mid-first-grade level in reading and mid-second-grade level in arithmetic (Bereiter, 1967). Children who attended the Academic Preschool at ages four and five have mean reading achievement at grade 2.60, mean arithmetic grade level at 1.87, and mean spelling grade level at 1.87 (Academic Preschool, 1969). In another program, spelling and arithmetic scores do not differ for experimental and control groups but reading scores for the experimental group are substantially higher. After the program 63 percent of the children are in public or private mentally retarded special classes (Fouracre, Connor, and Goldberg, 1962). On the MRRT the J. F. Kennedy preschool is favored over a Head Start group and a group with no preschool on verbal readiness and number readiness (Block, 1968). After seven weeks of Head Start, children show gains on the Lee-Clark Reading Readiness Test but no gains after seven weeks in kindergarten. Non-Head Starters show no gain after seven weeks in the same kindergarten (Diehl, 1967). No differences between Head Start and Non-Head Start children are found in kindergarten or in first grade learning ability (Cawley, Burrow, and Goodstein, 1968).

On the MRRT, Numbers Test, DADV children are inferior in the amount and kind of math information they possess as compared to MSES children. Approximately 23 percent of the children from ADV communities and 8 percent from DADV communities were judged ready for first grade instruction in math at the time of entrance into kindergarten (Searle, 1968).

Children's home activities are not found to be correlated with either reading readiness or first grade reading achievement. A significant difference in daily schedules is found among children of the three SES levels. LSES children perform least well on the MRRT and on the Gilmore Oral Reading Test and the Stanford Achievement Test (Miller, 1970).

SES is a significant predictor variable of second grade reading and arithmetic achievement but not of first grade reading and arithmetic success (Hirst, 1969; Smith and Bissell, 1970). In a reanalysis of the effect of full-year Head Start on the overall sample of first-grade children, the Head Start groups scored higher than the control group on the MRRT by a large margin. The percentage of Head Start children in the subsample classified into "below average" groups is only 26.3 percent while over 47 percent of the control children are similarly classified (Smith and Bissell, 1970). The kindergarten teacher's prediction of the child's success in reading survives as a predictor variable for the end of first and second grade reading (Hirst, 1969; Hirst, 1970). The MRRT Numbers Subtest enters first in the regression analysis for total group first grade reading achievement. The Matching subtest improves the prediction of male and female first grade reading success, but the MRRT adds little to the success of predicting second grade reading achievement. Intelligence test and creativity test scores add no predictive value for first and second grade reading achievement (Hirst, 1969; Mayans, 1967). In general, measures of self-concept and of ego strength taken at kindergarten level are predictive of reading achievement two and one-half years later (Wattenberg and Clifford, 1964). Another study shows that reading level for ADV culturally mixed and DADV children in first grade can be predicted from psychological test scores secured early in the kindergarten year (Mayans, 1967). A group of DADV Head Starters achieves a greater amount of change from pretest to posttest on the math sections of the WISC and Head Start Arithmetic Test than a comparison group (Adkins, 1969).

Classes with one teacher and one aide experienced the greatest gain on tests of reading readiness and total readiness on the MRRT when compared to classes with one teacher and no aides and one teacher and five aides (Goralski and Kerl, 1968). ADV kindergarten children score higher on the MRRT than the average and the average score higher than the

DADV (Hanson and Robinson, 1967; Mayans, 1967). When groups in first grade were equated for occupation and MA, it was found that among the children of skilled workers the Head Start group with mental ages above 77 months achieved higher than the non-Head Start group of the same MA (Ramsey and Boercker, 1967). Summer Head Start programs appear to be ineffective in producing any gains in cognitive development that persist into the early elementary grades. Full-year programs are marginally effective in producing gains in cognitive development detected in grades one, two and three (Westinghouse Learning Corporation, 1969). Prekindergarten Head Start children compared favorably to beginning suburban kindergarten children on the goal card except for identifying objects in nature and identification of color. Prekindergarten classes meeting a full year did better than ESEA classes which met for five months. Then children made significant gains in pre-grade one on the goal card (Jacobs, 1967). There is a difference in the achievement of older and younger pupils (Koch, 1968). Urban LSES children are in the bottom group on all measures compared with MSES children. There is a consistent tendency for the urban Head Start group to outperform the urban non-Head Start group. The small city-rural Head Start group does not display the cognitive defects that distinguish the urban DADV child (Hillery, Lindgren, and Remstad, 1969). Children in a program in kindergarten, first and second grade are no different from their controls (Jenkins and Phillips, 1968). Head Start does not produce a specific gain in reading readiness or information (Hess, 1966).

Few LSES children had heard stories or had books read to them by their parents. Few had gone on family trips or to the library. They have dramatized stories, or made up stories which they later used in their play. Some could recognize some of the letters of the alphabet but few could recognize words. Few LSES children could interpret appropriate pictures. The majority of the children do not have a good sense of left-to-right progression. There is a significant difference between MSES and ULSES children and LLSES children (Miller, 1969).

Concepts.--On discrimination tasks HSES children learn faster and make more correct responses than LSES children (Spence and Dunton, 1967). Children trained with more instances were superior on the Transfer-to-New-Instances Test to those who received fewer instances which were repeated. DADV children demonstrate near transfer when they are exposed to an intermediate condition of variety in training. The transfer occurs when children have been trained on many instances of few categories and when the near transfer test involves classifying new instances of workers within those categories (Schwab and Stern, 1969). Both boys and girls learn boys-words and girls-words equally well. Retention of words originally acquired is independent of sex, word type, and ability of the subjects (Harris, 1969).

Head Start children increase their proficiency as measured by the Preschool Inventory (Nimnicht, Rayder, and Tuck, 1970). They are ahead of their control counterparts on the Preschool Inventory (Sontag, Sella, and Thorndike, 1969). ADV children score higher than DADV children on the Matching Familiar Figures Test (Mumbauer, 1969). Item recognition improves with age (Irvin, 1967). On discrimination tasks on which letters are either the same or different, the group which was told not to turn letters and why is better than the group which was told nothing. The latter group is better than the group which was encouraged to turn the letters if they desired (Caldwell and Hall, 1968). Ranked means for the concept categories indicate the highest performance on color and the lowest performance on time concepts. Non-English speaking children are more than one standard deviation below the population mean and are consistently below the population mean for each concept category. Non-English speakers' performance on conjunction relative to other categories is lower than that of the entire population (Locatis and Smith, 1969). With fives the greatest amount of transfer occurs on the size problem. A tendency to perseverate is associated with LSES and with fives (Scholnick, Osler, and Katzenellenbogen, 1968).

There is a significant difference between HSES and LSES Israeli children on subtests measuring similarities and arithmetic (Smilansky, 1964). Teachers of LSES children are less accurate in predicting performance on matching words but more accurate in predicting performance on the letter knowledge tests that are teachers of MSES children (Koppman and LaPray, 1969). Head Start children are superior to non-Head Start children under four incentive conditions. There is no difference between two Head Start groups' overall performance or between their performance under the four conditions which follow: light only as reward, promise of candy, M and M immediate reward, and token-beans later exchanged for candy. Immediate reward is favored for non-Head Start (Berke and Johnson, 1967).

Tests relatively best performed by pre-grade one children are recognition of body parts, colors, concepts of location and space, rhyming words and counting objects out loud (Jacobs, 1967). Children whose mothers had eight to twelve years of education scored lower than other groups whose mothers had more education on five subtests of the Comprehensive Mathematics Inventory. There are no significant differences between the groups of children whose fathers are on relief or unemployed and the groups whose fathers are low or unskilled workers except that the first scored higher on pattern identification than the kindergarteners in any of the other groups. In a majority of the subtests kindergarteners whose fathers are unemployed or on relief or whose fathers are unskilled workers score higher than kindergarteners whose fathers are highly skilled workers or members of the classic professions (Rea and Reys, 1970).

Summer Head Start children studied during their kindergarten year perform at a higher level than non-Head Start children in all concept areas (color, form, space, grouping, and time duration). The Head Start children have greater ability to define words in terms of characteristics, time and sequence concepts. Head Start children began kindergarten at a higher level than non-Head Start children. The LSES group can show ability to match colors used by another person, articulate interrelated objects and/or lines and utilize such connections in their drawings. They have moved toward being able to tell a sequential story, group according to context of material, rank objects according to personally determined dimensions, and follow teachers' established order (Allerhand, 1965). Both reversal and nonreversal discrimination learning is better after delay (Viney and Varner, 1967). Scores of LSES children cover a wide range on the Arithmetic-Concepts Inventory for Kindergarten and Entering First Grade, but the mean is much lower than the mean of MSES children (Montague, 1964).

Creative processes.--Data suggest that high IQ does not necessarily indicate high creativity (Clos and Serafica, 1967). Fives make the fewest errors and have no difficulty with discerning the roundness, pointedness or squareness of an object using a programmed text devised to train children in some art forms (Clos and Serafica, 1967). There is some difference in scores of creativity in the use of painting materials between ADV and DADV groups (Moyer, 1968). Few LSES children dramatize stories at home or make up stories that could later be used in their play (Miller, 1969).

Intelligence.--Children in a nonautomated Responsive Environment measured on the S-B and PPVT are no different from controls on objective measures. Greatest gains occurred with children from the most disordered homes while children from homes with greater integrity maintained their superiority (Blatt and Garfunkel, 1965). Children ages five to seven have an IQ increment of 11 points (Kugul and Parsons, 1967). Gains of IQ on the S-B from pretest to posttest average five to six points (Baer, 1967; Hayweisser, Massari, and Meyer, 1967). Children in a preschool enrichment program and Head Start show initial IQ gains while controls show no gain or decrement. IQ's of both groups remain stable after entry into primary school (Kodman, 1970; Cunningham and Pierce-Jones, 1969). The IQ gains of LSES kindergarten groups are higher than LSES non-kindergarteners' gains, although non-kindergarteners' mean IQ gain is five points (Pineault, 1967). Children in the Academic Preschool made less IQ gains on the S-B as fives than they made as fours, while the comparison group actually lost points (Academic Preschool, 1969). IQ gain scores for Group I children given the S-B at home one week before Head Start began, Group II children given the Binet during the first week of Head Start, and Group III children given the Binet during the second week of Head Start were significant (Meyer and Egeland, 1968).

Head Start and Daycare children are higher on nonverbal scores than on verbal scores. Head Start children are more nonverbal than

Daycare children (Stern, 1966). The higher the initial IQ score, the greater the gain for a sample in an academically oriented preschool (Reidford and Berzonsky, 1969). In another study the lower the initial IQ score, the greater the gain (Smilansky, 1964). Also, Head Start activities are more effective with low IQ children than with high IQ children (Daniel and Giles, 1969). LSES children in experimental programs have higher IQ gains as measured by the ITPA than their comparison groups (Reidford and Berzonsky, 1969; Hodges, Spicker, and McCandless, 1967; Fouracre, Connor, and Goldberg, 1962; Smilansky, 1964). The "At-Home" group in this case shows IQ gains in first grade great enough to conceal former differences (Diagnostically Based Curriculum, 1969; Hodges, Spicker, and McCandless, 1967). Children measured on the Pictorial Test of Intelligence are about nine IQ points above children from the same neighborhoods who have not attended preschool (The Preschool Program, 1969). Bicultural preschool Mexican American children's total scores at posttest on the WISC are higher than the control group as well as a comparison Head Start group (Henderson, Rankin, and Frobisker, 1969).

DADV children differ from ADV children on IQ tests (Moyer, 1968; Thompson, 1966; Bittner, Rockwell, and Mathews, 1969; Mumbauer and Miller, 1969; Mumbauer, 1969; Irving, 1967). In a Montessori Head Start program Mexican Americans tested much lower on the PPVT pretest than Anglo children. Both groups gained seventeen to twenty-two points on the posttest. The increment in MA ranged from four to twelve months after the six-week program (Johnson, 1965). Two out of seven school districts in a diagnostic remedial language program made gains on the PPVT (Curtis and Berzensky, 1968). Thirty-eight classes of Mexican Americans, Negroes, and Anglos out of forty-seven made gains in a preschool program as measured on the PPVT (Preschool Program, 1969). PPVT scores of

LSES children with no preschool are lower than those of LSES children with preschool experience (Smith, M., 1968; Bittner, Rockwell, and Mathews, 1969). Children whose parents participated in the preschool program score higher on the PPVT pretest and continue to score higher than children of non-participants on entry into first grade and again at entry into second grade. Children who entered preschool at age five made expected IQ gains, and those who entered at age four made only the expected gains (Bittner, Rockwell, and Mathews, 1969). Mean IQ for DADV fives varies from 72 (Melton and Others, 1968) to 92 (Mumbauer and Miller, 1969) to 105 (West Virginia Head Start Report, 1968). The mean IQ score of reflective children was higher than the mean IQ score of the impulsive children. A greater number of DADV children were rated impulsive (Mumbauer and Miller, 1969).

Head Start data vary. Children in some Head Start programs are ahead of their control counterparts on the Pre-School Inventory or S-B (Sontage, Sella, and Thorndike, 1969). Others show no difference with their non-Head Start peers (Capobianco, 1967; Krider and Petsche, 1967).

Only fives in the Direct Verbal group made IQ gains during the second year of the program. The two structured programs had fewer children who regressed and again had more children who made gains of ten or more points. Low Montessori children made substantial gains. IQ remained relatively stable in public kindergarten (Karnes, Hodgins, and Teska, 1969).

In a group of children with estimated IQ less than 90, 54 percent had Social Maturity scores less than or equal to their CA. Twenty-three percent of these were less than or equal to six months greater than their

CA, and 8 percent were greater than or equal to one year greater than their CA (Norton, 1969). DADV children in Head Start and experimental programs show significant gains in IQ (Kugel and Parsons, 1967; Michigan Head Start Evaluation and Research Program, 1968; Irving, 1967). Pattern analysis of the WISC is not an appropriate approach to identification among kindergarten children of reading success through second grade (Hirst, 1969). A comparison of the average IQ differences of Israeli children of Oriental and European cultural backgrounds shows that scores are higher in the experimental group in each ethnic group and in the experimental group as a whole (Smilansky, 1964). Mexican American fives scored lower on the PPVT than MSES twos and threes (Palmer and Others, 1968).

Children who had previously attended a Rural Child Care Project Center for a minimum of sixty days show a loss in S-B IQ by the time they have had two years of formal schooling. The loss is greatest during the first public school for those children whose initial IQ scores were above 80 (Briscoe, and Archambo, 1969). Children attending childcare centers in two sub-communities show IQ gains (Oakland Interagency Project, 1964). The kindergarten group which had a supplementary class and home counseling shows the greatest S-B IQ gain (Radin, 1969).

Language.--LSES groups ask fewer classroom questions. They manifest more of an initial tendency to make statements rather than ask questions (Dorn, 1967). Bilingual children have an advantage in having two languages, in use of names in sentences, and in constancy. Object constancy should be in advance of naming and naming should be in advance of using names in sentences (Feldman and Shen, 1969). DADV children differ from ADV children on vocabulary scores (Moyer, 1968). English working class children use more pronouns at the head of the nominal group for third person while MSES use more nouns (Hawkins, 1969).

Puerto Rican mother-child pairs were twice as active as the Negro group in verbal and non-verbal forms of communication which encouraged exploratory behavior and learning. Puerto Rican groups had higher activity rates than Negro groups in such categories as "teaching," the reinforcement of verbal praise, smiles, touch contact, and related areas. They were less active in the use of verbal admonitions and "don't's" in critical comments, in directing and coercing verbal and non-verbal communications (Weissman, 1967).

The use of toys with Navajo children following the regular school curriculum provided a broadened basis for language use, brought much new information, expanded vocabulary, clarified word meaning, and made learning concrete instead of abstract in every subject studied (Stout and Langdon, 1964).

Length of sentence does not differ between DADV and ADV children, but there is some relationship between naming and defining ability between the two groups (Moyer, 1968).

Children generally respond better to something familiar to them as shown by the use of familiar ceramic art objects with kindergarteners (Schwartz and Douglas, 1967). A majority of LSES and MSES children taught by a home visitor understand that codes stand for language, and they seem to understand the permanence of the written code. Almost 80 percent can form a sentence with picture symbols (Levin, 1966). DADV children in experimental programs show gains in language and on the Language and Speech Evaluation Test (Anastasiow, 1966), after use of the Oral English Language Lesson (Hagen and Hallahan, 1968), in groups where their mothers received the intervention treatment (Strickland, 1967), as measured by readiness tests (Cunningham and Pierce-Jones, 1968), and after language lessons from a special teacher (Cleveland, 1967). A Montessori group made gains over a non-Montessori group in the area of verbal ability. There was a positive correlation between a positive attitude toward learning and verbal ability (Fleege, Black, and Rackaukas, 1969).

DADV Mexican American children produce considerably fewer words to describe pictures than Negro and Anglo children. They were younger and of lower mental ability (Stern, 1966). No single pattern is identified which is superior to any other pattern in learning to the acquisition of an entire list of words (Harris, 1968). In mediational processes individual children were observed verbalizing category names as an aid in selecting appropriate pictorial responses (Schwab and Stern, 1969).

Negro, Anglo and Spanish surname children entering first grade are aware of and use the basic English syntax patterns in approximately the same way (Silvaroli and Whitcomb, 1967). Appalachian fives and sixes differ from the national norms on every ITPA subtest except Auditory Vocal Sequencing and Visual Encoding. Their greatest deficits are in encoding tasks, the Visual Motor Sequential task and the Auditory Vocal Automatic task. There is an increased decrement as age increases on Motor Encoding, Vocal Encoding, and the Auditory Vocal Automatic subtasks (Hooper and Marshall, 1968). Indian children score particularly low on verbal measures. The discrepancies between verbal and non-verbal scores are significant. The children do perform more adequately with the physical manipulation of dolls (Shipman, 1967).

An experimental group made greater gains in language development on the ITPA than a comparison kindergarten group and an "At Home" control group (Hodges, Spicker, and McCandless, 1967; Diagnostically Based Curriculum, 1969). In a follow-up study the experimental group exhibited decelerated progress in first grade, the kindergarten group maintained progress, and the "At Home" group exhibited accelerated progress (Diagnostically Based Curriculum, 1969). Another experimental group gained in language age on the ITPA more than their CA shift in the same period. There was regression on four of the subtests by the control group in the same period (McConnel, 1969). DADV children were initially deficient on three subtests of the ITPA: Vocal Encoding, Auditory-Vocal Automatic, and Auditory-Vocal Association. On the ITPA total the Direct Verbal group was higher than the four other groups in the study and only Direct Verbal showed a substantial gain (Karnes, Hodgins, and Teska, 1969). A small city-rural Head Start group shows strength in symbol recognition and picture vocabulary at the end of twelve months which is above the norm (Hillery, Lindgren, and Remstad, 1969).

Although experimental children score higher than controls on subtests of the ITPA, their scores are significantly higher only on the Auditory-Vocal Association subtest (Stearns, 1966; Milligan, 1967; Adkins, 1968). Only small amounts of change are noted in some Head Start programs, although teachers consider the children more verbal (Michigan Head Start Evaluation and Research Program, 1968; Hess, 1966). The mean gain of Mexican American children in a bicultural preschool on the verbal section of the WISC is higher than the control group's and an Anglo group's but not higher than the Head Start comparison group (Henderson, Rankin, and Frobisher, 1969). In several studies no differences on language measures are shown between Head Start and non-Head Start children (Adkins, 1968; Hubbard and Zorate, 1967; Barclay and Kurcz, 1969; Eisenberg and Connors, 1966). Scores after a six-week program are still lower than normative sample (Eisenberg and Connors, 1966). When compared with non-Head Start children, some Head Start children are more advanced in length of sentences, use of advanced vocabulary lists, use of noun-linking verb-noun sentence patterns, lack of use of partial or incomplete sentences, and use of vivid and colorful expressions (Daniel and Giles, 1969). Also noted was more frequent use of questions, increase in mean word length of utterances, improved comprehension of verbal material, and the ability of the children to monitor their own speech and correct themselves spontaneously (Adkins, 1968).

The order of difficulty of structures for DACV fives from most to least difficult is: 1) relative clause, 2) negation, possessive, transformation subordinate (these three were tied), 3) passive, inversion, conjunction (these three were tied), adjective, separation, and transformational-object. The length of the sentences is related negatively with the number of correct responses for the structures in an imitation task and not related to the comprehension task (Osser, no date). LSES children score lower than MSES children on the Vocal Encoding subtest of the ITPA (Howard, Hoops, and McKinnon, 1970). In another study, no difference is obtained between MSES children and Head Start children for verbal expression although the mean score of the Head Start group is significantly lower than that of the MSES group (Giebink and Marden, 1968).

Memory.--As string length increases for more complex language forms, Head Start fives' performance drops below the MSES fours' performance

(Horowitz and Horowitz, 1967). The mean error to criterion on paired associates learning tasks of the DADV group is more than the mean of the ADV group (Mumbauer and Miller, 1969).

Mediational processes.--A Head Start group which listened to stories, answered questions about them, and was provided knowledge of their performance after question asking scores higher than a second group which did not get feedback and a third group of whom no questions were asked (Goolsby, 1968).

Perceptual processes.--There is a positive relationship between perception of mother and perception of teacher at the beginning and at the end of the school year. Rebellious children show a greater perception of teacher and mother at the beginning of but not at the end of the school year (Franco, 1965).

LSES children do not have a good sense of left-to-right progression, They are able to discriminate between objects which are nearly the same size. Few of the children could discriminate between b and d (Miller, D., 1969).

A Head Start group shows a gain in skills in Vocal Encoding and Auditory-Vocal Automatic subtests of the ITPA over a control group (Byrne, 1967). A group of Appalachaian children's IQ scores on the PPVT are below the national average at age five. Scores on the S-B are within the national norms (Hooper and Marshall, 1968). Age, socioeconomic differences and size of cues are significant factors when ADV and DADV fives and sixes are compared using two-dimensional pictures as the stimuli (Baikie, 1969).

Children who had received visual discrimination training scored higher than their control groups on the Lee-Clark Reading Readiness Test and the Letter-Form-Training Criterion Test (Wheelock and Silvaroli, 1967). In a Head Start group Visual Motor Association was the most improved ability during the preschool year as measured by the ITPA and strength in this area was maintained in first grade (Cawley, Burrow, and Goodstein, 1968; Hillery, Lindgren, and Remstad, 1969). A control group did exceed the experimental group on Visual Decoding items of the ITPA after a two-year program (McConnel, 1969). HSES and LSES children do not differ on the Auditory-Vocal Association and Auditory Decoding subtests of the ITPA (Howard, Hoops, and McKinnon, 1970).

General cognitive.--Dream interview data collected from Head Start and Indian children is consistent with previous findings that fives and sixes express modified realism concerning dreams. There is confusion about external and internal natures of a dream (Shipman, 1967). Three of five DADV fives solved a problem involving a tilted balance board. During a five-week period two DADV children were just beginning to learn fundamental notions such as "If this end of the board is down, it is not up." It took seven weeks to teach them to say "or." Only one passed the conservation task using level of water in jars (Englemann, 1967).

On object sorting tasks, Indian scores are similar to those of LLSES Negroes, but the Indian children score particularly low on verbal measures (Shipman, 1967).

On Piagetian tasks, 31 percent of eighty Appalachaian subjects ages five and one-half to six and one-half passed one of the conservation tasks. Seventy-five percent failed both tasks requiring distinctions between identity and equivalence while 13.75 percent passed both tasks and 11.25 percent passed identity. No child failed equivalence and passed identity. Fifty percent passed the undimensional seriation and serial correspondence tasks. There is a marked age progression for males on multiple seriation and multiple classification. Children who passed one conservation task tended to score high on multiple classification and multiple seriation as compared to nonconserving subjects (Hooper and Marshall, 1968).

Twenty-nine of thirty-one Head Start fives cannot handle the terms "more," "same," and "less." After receiving training seven of seven Head Start children demonstrate mastery of conservation on posttest. None of the nine nonconservers who were not trained change their performance in any way. Two of three transitional conservers achieved full conservation (Blum, 1967).

Twelve of twenty-four subjects ages five years four months to six years four months who received training show some evidence of conservation on the posttest. Six of the children demonstrate it on juice, eight on sand, and nine on clay, although clay does not share with the training substance (juice) the property of being pourable. Of the 38 "same" responses, 3.2 were accompanied by adequate explanation. The stability of the experimentally induced concept measured by the child's reaction when faced with an apparent contradiction of the conservation principle appears similar to the stability evidenced by the conservation group who had the concept before the experiment started, based on the performance of five experimental subjects who demonstrated conservation at a level similar to that of the conservation group (Brison, 1967).

More MSES children are found to be conservers than LSES children (Baker and Sullivan, 1970). LSES children make more inconsistent nonconserving responses compared to MSES children. LSES children's conservation responses increase with age (Rothenberg, 1969).

Disadvantaged Anglo children, mixed ages

Concepts.--In a two-choice probability learning code for each SES group, higher probability and lower magnitudes are preferred to lower probabilities and higher magnitudes (Silverman and Shapiro, 1970).

Disadvantaged Negro children, mixed ages

Ability, specific.--All Negro DADV children in the study score much lower on the MRRT after their first month of school than the norms. The group that had attended a Preschool Readiness Center Program scores higher than a summer Head Start group and two control groups with no preschool experience and as high as a MSES group with no preschool. On the MAT at the end of first grade the Preschool Readiness group scores lower than the MSES group and is the same as all other groups (Bittner, 1968).

Concepts.--Fours and fives in Head Start display rates of naming colors which are considerably lower than rates of naming number and size attributes. For a third of the children, use of a color adjective had never been recorded during five months of school. During a 50-day period when positive reinforcement was given through teacher praise for correct use of color adjectives, the group's average for use of all color adjectives increased from 0.5 to 1.8 per sample hour. Use of color nouns increased from 0.2 to 0.4 per sample hour. During the nineteen days in which access to snack and materials was contingent upon use of a color and noun combination, the use of all color adjectives rose to 18.6 per sample hour. In contrast, the use of number size adjectives showed little change from the preceding period. During the fourth period when all contingencies were removed, the overall rate of using all color adjectives decreased to 12.7 per sample hour with 58 percent of color adjectives followed by the object referred to (Hart and Risley, 1968).

Fours and fives make consistently more errors when identifying letters from highly confusable alternatives than numbers. For each letter of the alphabet, the letter most frequently confused with it is the one with the smallest percentage of distinctive features except for the letters q and u (Redalia, 1969).

Intelligence.--Groups below average in IQ range make a significant change between pretest and posttest. The average group shows no change while the above average group scores lower on posttest (Bittner, 1968).

Language.--LSES Negro children's performance on speech imitation and comprehension tasks is inferior to Anglo MSES children's performance. Data on the Negro LSES's suggests that whether comprehension occurs or not, the imitation response will tend to conform to the dialect which is familiar to the child even when the test sentence is not encoded in that dialect (Osser, Wang, and Zaid, 1969).

Four and five-year-old Negro boys made gains more than age-norm expectancy in 24 cases while girls made gains in 18 cases on the ITPA. There is a general rise in total scores for all three experimental groups. Largest gains are found on the Motor Encoding subtest and the Visual-Motor Association subtest (Anastasiow, Stedman, and Spaulding, no date).

There is considerable within-sample variability on the ITPA. With the exception of Auditory-Vocal Sequencing and Auditory Decoding, the study sample mean scores are lower than national sample. Some LSES children score at or above their CA on some subtests from six months to three years (Sigel and Perry, 1968).

Disadvantaged children with unidentified or mixed ethnic background, mixed ages

Ability, specific.--Head Start children show irregular growth trends in counting ability with a median of eight numbers. Girls are able to count higher than boys with this trend reversed with MSES children (Pollio and Whitacre, 1970). After a six-week Head Start program, Mexican American children show less progress than Anglo children on reading and arithmetic readiness. The Mexican Americans are at a pre-reading stage (Johnson, 1965).

Concepts.--Item recognition improves with age (Irvin, 1967). LSES children improve in discrimination performance to a greater extent than HSES children as a result of familiarization with test items (Covington, 1967). LSES children who prefer color learn to discriminate stimulus objects slowly and make nonreversal responses regardless of the attribute upon which they were trained; form preferring children show the opposite behaviors (Trabasso, Stave, and Eichberg, 1969). HSES children learn faster and make more correct responses than LSES children on discrimination tasks (Spence and Dunton, 1967). Material involvement in a program with older siblings has a definite effect on younger siblings' concept attainment (Gilmer, 1969).

Creative processes.--In a pretreatment study of Israeli children on which an intervention program was based, the following characteristics of DADV children's play was found: most DADV children are at the stage of manipulation or using miniature replicas as "props" but almost none are above this stage, i.e., using undefined play objects, substituting verbal description for objects; verbalization serves the function of play only and is not imaginative or make-believe. Also, DADV children are "act-and-object-minded"; the function and behavior of the leader is one in which the DADV child takes on the role of authority; DADV children laugh at each other when handling problems or tensions; criticism is directly personal; DADV children are openly aggressive; and their spontaneous play takes place only within the classroom and in corners equipped for play. Before treatment about 69 percent of the children in all four treatment groups did not engage in any form of dramatic play, about 20 percent engaged in dramatic play, and only about 10 percent engaged in sociodramatic play. Older children played better than younger children. Improvement in each of the basic factors of sociodramatic play in order of gain occurred as follows: imitative role play, make-believe in regard to objects, make-believe in regard to action and situation, persistence, interaction, verbal communication (Smilansky, 1968). There is no relationship between IQ and play (Clos and Serafica, 1967; Smilansky, 1968).

Intelligence.--IQ scores derived from the S-B for Appalachian children exceed IQ scores derived from the PPVT. PPVT scores are below the national norms while S-B scores are within the national norms (Hooper and Marshall, 1968). In another program pretest scores on the PPVT were 91 for Anglos and 55 for Mexican Americans. On the Draw-A-Person both groups gained 17 to 22 points on the posttest (Johnson, 1965). Thirty two of thirty-five children regarded as mentally retarded show some increment in IQ after an experimental program (Kugel and Parsons, 1967). As measured by the PPVT, Mexican American children's mean gain (8.16) is greater than Negro children's gain (7.80), whose gain is greater than that of Anglos (2.6) (Preschool Program, 1969).

In a Montessori program very bright children do not show as marked a contrast with average children as the average do with the dull (Levy and Bartelme, 1966). Draw-A-Person is less affected than PPVT by factors associated with ethnic groups (Datta, 1967). Initial PPVT means of the Diagnostically Based Curriculum were lower than the means of the Perry Preschool Project. At the end of one year of the experimental program, their mean was 95.5 compared to the Perry Preschool Project mean of 74.7 after one year of preschool and 84.6 after two years of preschool (Hodges and Spicker, 1967).

In normal size classrooms with regular teachers, Israeli children ages five and six make a mean IQ gain from 90.6 to 109.7; the mean gain in groups ages four to five and four to six is 97.6 to 110.1. Children with the lowest initial IQ scores make the greatest gains (Smilansky and Smilansky, 1965).

Language.--Improvement in spontaneous play results in an improvement in verbalization during play, reflected not so much in quantity as in quality in terms of more play-related conversation, broader range of vocabulary and longer sentences (Smilansky, 1968). There is considerable variation within study samples as measured by the ITPA. Some LSES children score at or above their CA on some subtests from six months to three years. On Visual Decoding the score range is from 0 to 70 (Sigel and Perry, 1968). Children in the DADV groups have lower language ages than ADV children on the following subtests: Auditory Decoding, Visual Decoding, Auditory-Vocal Association, Vocal Encoding, Motor Encoding, Auditory Vocal Automatic, Auditory-Vocal Sequencing, and Visual-Motor Sequencing. Only Visual Motor Association was not affected by LSES. The DADV group use fewer words per utterance than their comparison group. The DADV were thirteen and one-half months below the performance of the ADV (Gerber and Hertel, 1969).

There is a marked positive relationship between the number of communication units used by each child and his scores on both forms' of the PPVT. There is also a positive relationship between the number of communication units and scores for naming the didactic materials (Wolman, Ferol, and Prescott, 1969). DADV children perform at a lower level than ADV children on tasks requiring the completion of a text describing stimulus pictures. The task using meaningful words is easier than the task using nonsense words (Giebink, Neville, and Davidson, 1970). Spanish surname children in experimental groups using oral English language lessons do better than control groups (Hagen and Hallahan, 1968).

Greatest gains for children in a summer Head Start program are on the Language Skills Factor. Head Start children are rated higher by their teachers than non-Head Start on speech production, naming, auditory discrimination, language structure and listening comprehension. At the end of one year of formal schooling, children judged to be from a LSES background irrespective of preschool experience are rated to be poorer on oral expression than are children of MSES background (Chorost and Others, 1967).

Before attendance in a program for Negro and Anglo children, threes through fives had small vocabularies, and communication was frequently affected by means other than the use of language. Children frequently repeated verbal directions but had difficulty in translating them into action until the words were accompanied by a physical demonstration. After the program there was a substantial improvement in language, although it was still deviant in some respects, i.e., small vocabulary and ungrammatical sentences (Malone and Others, 1967). Head Start children show gains on Vocal Encoding and Auditory-Vocal Automatic subtests of the ITPA (Byrne, 1967).

Perceptual processes.--Children in a Montessori program are better on most perceptual tasks and faster at completing them than children in other comparison groups (Berger, 1969).

General cognitive.--Children up to the age of seven or eight over- or under-differentiate the right-left concept (Elkind, 1961).

Anglo children of undesignated or mixed socioeconomic background, under five years of age

Attentional processes.--Active attending of under fives is increased by stimulus intensity (chromatic color) and decreased by decreased stimulus intensity (achromatic color). Stimuli varying in contour also make differences in the orienting response depending on the associational value of the stimuli (Dodd and Lewis, 1969).

Concepts.--There are no differences between deaf and hearing under fives on a conceptual cross-modal transfer involving discrimination between "something" and "nothing." Age is positively correlated with the number of trials required to reach criterion on the "nothing" problem. Deaf children perform better than hearing children in problems presented tactually (Blank and Bridger, 1966). Blind nursery school children make mistakes which show that they have difficulty distinguishing between reality and fantasy. They are going through a learning phase which is largely preverbal in sighted children, who begin to understand their world through single experiences with common objects but who quickly further experiences through vision.. For blind children it is the situations in which they have been most active that are recalled. The oral stage is prolonged; they mouth objects in order to recognize them and they also understand certain shapes by reference to their own bodies. The absence of visual cues to objects in the external world appears to make the child's representation of them uncertain (Wills, 1965).

On tests of color matching, matching black letters and black words has been found to be at least three times as difficult as the same task in color (Jones, 1965). In a shape and size learning task, no difference was obtained between absolute and relative shape learning. Children did not show preference for the "more" or "less" rectangular shapes. In contrast, the size studies showed differential preference for smaller stimuli. Fours learned the rectangular shape more easily than twos with no interaction between age and type of problem (Rane and Berman, 1968).

Creative processes.--Two types of divergent thinking ability from the Guilford Tests, ideational fluency and originality, are related to mothers' education. These two types of ability are also highly correlated with area of residence. Both factors were higher for the western than the midwestern sample. Correlation of the divergent abilities with age is almost zero (Stott, 1968).

Intelligence.--Anglo under fives make higher scores on the PPVT than Mexican American and Afro-Americans, but there are no differences between the scores of Mexican American and Afro-American children (Edwards and Stern, no date).

The intelligence of Anglo under fives is affected by a number of factors including prematurity, physical stature of parents, and physical condition immediately after birth. Among Anglo under fives, the relative position of prematures is less favorable than full-term infants. At three to five the proportion of prematures classified in the low-average or above categories on the S-B is 84 percent as compared with 94 percent for the full-term. The majority of prematures fall within the normal range and their distribution of intelligence ratings closely approximates that found for those born at term, although it is somewhat on the lower side (Harper, Fischer, and Rider, 1959). The children of large-chested parents have higher IQ scores on the S-B at two, three, and three and one-half years of age. These IQ differences in the preschool children of large-chested parents and small-chested parents decrease with age and by age ten are negligible (Kagan and Garn, 1963). Scores evaluating aspects of physical conditions at one and five minutes after birth are significantly correlated with scores evaluating intelligence (S-B), conceptual abilities, and fine and gross motor coordination at four years of age. Magnitude of the correlation is higher for fine and gross motor coordination than for intelligence and conceptual abilities (Edwards, 1968).

Intelligence does not appear to be affected by birth size or elective induced labor. At age four, undersized term infants who had birth differences in weight, length and head circumference do not have statistically different IQ's on the S-B from larger infants of comparable gestational age despite the fact that a much smaller number of these mothers had completed twelve years of school as compared to the mothers of the larger infants (Babson and Kangas, 1969).

A higher median IQ on the S-B was noted among fours delivered through short elective induced labor than among the normal-labor controls (Niswander, Turoff, and Romans, 1966).

In anthropometric measures, institutionalized mental defectives from three to five years of age have normal mean stem height values but mean weight is below normal at all IQ levels and diagnoses. Mean head circumference and chest circumference measures are within normal limits for all IQ levels and diagnoses (Mosier, Grossman, and Dingman, 1965). Psychological appraisal of fours with cerebral defects indicates that there is never a ready made solution to the difficulties that arise for children with handicaps (Taylor, 1959).

Language.--On three subtests of the Preschool Language Battery, Anglo and Mexican American under fives score higher than Afro-Americans and on sequencing the differences between the Anglo and Afro-Americans are in favor of the Anglos, with even greater differences between the Mexican Americans and the Anglos. Children enrolled in the school which employed teachers with the most experience tended to score higher than the children in the other schools (Edwards and Stern, no date).

The main purpose of communication of deaf under fives with their mothers is to inform them about things or events in their environment. Non-oral modes such as gesture, demonstration, and combined speech and gesture are the modes primarily used by the children. The mothers' main purpose of communication is to direct the activities of their children. To do this the mothers use the oral mode most often, but also rely heavily on non-oral modes. Mothers are not able to describe accurately the communication according to mode characteristics, but they do have an accurate perception of the purpose of this communication

(Collins, 1969). When tested for the comprehension of "more" or "less," the great majority of under fives give no indication that they are able to differentiate between the two. The children show a marked tendency to make the same response irrespective of which of the two words is used in the instruction (Donaldson and Balfour, 1968).

Memory.--When threes and fours are asked to identify two objects, one that was seen and handled and one that was seen, from a collection of four objects two days later, they remembered the two objects equally well (Weiner and Goodnow, 1970).

Mediational processes.--In a modified reversal-non-reversal shift task involving responses to size and brightness, 37.5 percent of threes mediated and 50 percent of fours mediated. The percentage of children showing non-reversal shifts did not change with increasing age up to ten years while the percentage of children showing inconsistent responding decreased from about 40 percent at age four to about 10 percent at age ten. Mediators learn the task faster than inconsistent responders (Kendler, Kendler, and Leonard, 1962). In a similar reversal-non-reversal shift experiment both control and non-reversal groups showed positive transfer while the reversal groups showed negative transfer. No significant effect is due to verbalization (Kendler, Kendler, and Wells, 1960).

In an identification and assessment of thinking abilities of young children using test items from the Merrill-Palmer and the test by Guilford, two kinds of convergent thinking--"ability to organize spatial systems" and "speediness in spatial modeling"--and a cognitive factor--"general reasoning"--were identified. General reasoning is most related to mother's education. Speediness in spatial modeling is also related to mother's education. Area of residence is highly correlated with ability to organize spatial systems with this relationship higher for the western than for the midwestern sample. The two convergently produced abilities are correlated with age. The "Q" analyses give some substantial evidence that ability patterns of children can be classified by types (Stott, 1968).

Perceptual processes.--Under fives prefer to deal with flat copy in terms of shape as opposed to contour. This preference gradually declines with increasing age until about ten years, when shape again becomes preferred (Nelson and Bartley, 1962). At every age between two and ten, children can repeat a longer sequence of numbers than of nonsense syllables with the exception of age three. The appreciation of form, shape and size from age three to four is clearly a testing artifact. Very few threes can understand the directions of the tests. While threes and fours can motorically match similarities, they do not grasp the concept of same or different verbally. The rate of perceptual growth is inversely related to age. Between three and four, 40 percent of perceptual growth has occurred (Martin and Others, 1969). At age four the identity of an object is not fully separated from the child's own experiences. This lack of differentiation precludes an active discriminatory matching power. The four can only see one undifferentiated thing at a time and he does not make related hypotheses (Potter, 1966). In pattern recognition, coaching can help the child respond by correctly producing a pattern, seemingly through the intervention of language. If a three year old can be led to say, "These are at the bottom" in describing a model on a board, he can move to the bottom of the board without error. He can then handle parts of the model that are easily encoded in terms of "top" or "bottom" or "this side," even if the model is placed at some distance from the lightboard. It seems that the child must learn some way of abstracting a model of a thing from the real thing. Diagrams and even pictures require practice before they can be used as substitutes for the "real thing." The component skills of mapping, locating, and utilizing information change with the growth of the child's powers of representation, producing conjointly a shift from search, through pattern matching, to information selection. Threes show search strategy. The search of any particular child can be shown to be non-random, an orderly search for bulbs that will light; but the search is conducted quite independently of the diagrams mounted in front of the child. The plan for gathering information does not emerge from the models presented the child. The older the child the less likely he is to use this primitive strategy (Olson, 1966).

General cognitive.--Anglo threes of mixed SES make conserving responses for rows of M and M candies when either the usual Piaget question is asked or when they are asked to pick the row that they would rather eat, no matter which question is asked first. For fours, however, if the usual Piaget informational question is asked first, conserving responses are low, but if they are first asked which row they would rather eat and then asked which row "has more," they perform as well as the threes. Their responses to the "eat" question are essentially the same in either order. This suggests that the fours are acquiring an increasingly complex meaning for "more" than they had as threes and that this confuses them by complicating the question, but that the "eat" question first specifies the sense of "more" in question and they then proceed to make the judgment on that basis for the information question which follows it. The study distinguishes conserving responses from conservation proper (Ayabe, Gotts, and Hardy, 1968).

Although the theory of conservation suggests that it is not possible for children to attain conservation across illusory transformations because there are no changes in the opposite direction, it has been found that children have no more difficulty attaining conservation across an illusory transformation than they encounter in attaining conservation across a transformation. The explanation is believed to be that identity conservation and equivalence conservation are mediated by different processes (Elkind, 1966). Fours are able to discriminate among proportions differing by .20 but not .10. Mode of presentation has no effect on accuracy. Corrélations between age and accuracy indicate that 80 percent and 90 percent problems present the best test of the child's ability (Widom and Ginsberg, 1968). Children respond to their teacher's attempts to elicit comments from them. In an experiment in which two teaching styles, elaborative versus non-elaborative, were observed, under fives in the elaborative group came up with more alternative solutions to the tasks presented. There was a significant interaction between the group and kind of statement, group and instigation as well as a three-way interaction between group, kind of statement, and instigation. A large number of teacher elicited elaborations characterized the elaborative group while the number of spontaneous elaborations for the two groups was the same. The non-elaborative group gave a greater number of total directive statements. The teachers of this group gave many more directive statements. The greatest differences in performance were in two verbal tasks, the Similarities Task and the story telling task, with the elaborative group making gains on the Similarities Task and the non-elaborative group showing a decrease on the story telling task (Smothergill and Others, 1969).

Negro children of undesignated or mixed socioeconomic backgrounds, under five years of age

Intelligence.--As measured by the revised S-B and the Gesell Developmental Scales and physical examinations, the smaller the baby is at birth the less likely he is to maintain the status of normal or to improve if not normal. For non-white premature infants the proportion classified as low-average or above was 93 percent at forty weeks and for full-term it was 97 percent. At three to five years these proportions were 68 percent and 79 percent, a difference of 11 percent. The great majority of those born prematurely fall within the normal range of intelligence, with the distribution closely approximating those born at term, although somewhat on the lower side (Harper, Fischer, and Rider, 1959).

Test results on the S-B are influenced by examiner differences. Testers seem to form clusters of "high testers," "low testers," and "middle testers." Testers elicited higher means from children not of their own sex (Cieutat, 1965).

Negro under fives make lower scores on the PPVT than Anglo under fives but there are no differences between scores of Negro under fives and Mexican under fives (Edwards and Stern, no date).

Language.--On three subtests of the Preschool Language Inventory Negro under fives make lower scores than either Mexican American or Anglo children. Negro children score higher than Mexican American children on sequencing but make lower scores than the Anglo children

(Edwards and Stern, no date).

Children of undesignated or mixed socioeconomic backgrounds, under five years of age, mixed ethnic background

Concepts.--Under fives respond to color-form stimuli initially with more conventional or adequately descriptive names for form than for color with the frequency of form names increasing with age and frequency of color names decreasing slightly. With few exceptions, under fives respond by form or color and not by both. After training to name stimuli by both color and form, the children used both names more often than untrained children. Training also increased use of color names more than that of form names (Gross, 1964). A positive relationship exists between color naming, matching, and recognition even under incorrect conditions. The correlation is stronger between naming and matching than between naming and recognition (Dale, 1969).

Learning of oddity discrimination involving discrimination on the basis of size, form, and brightness occurs as a result of practice but is not affected by relevant redundant information or verbal or non-verbal reinforcement (Croll, 1970). Significant negative transfer effects in discrimination learning occur in fours when they are given an object discrimination task, which they can solve with ease, after an oddity problem which is difficult for them (Hill, 1965). Under fives make fewer correct responses in oddity problem learning than kindergarteners (Gollin and Shirk, 1966).

Discrimination learning is affected by a number of factors. Fours given "all cues" learn to discriminate stereometric objects more rapidly than fours given visual cues, but planometric and pattern discrimination are learned equally rapidly by groups given "all cues" and visual cues. Fours perform above chance level only when trained in stereometric objects (Falk, 1968). Nursery school children trained under irrelevant orientation conditions make more rotation and reversal errors than those trained under relevant orientation conditions. They also make more line to curve errors (Caldwell and Hall, 1970). In original learning there are no differences in the discrimination of size and brightness under conditions of verbalization and non-verbalization, but during transfer learning verbalization facilitates performance on the brightness dimension (Wolff, 1969). For fours, in another study, relevant verbalization shows a positive influence in discrimination learning. Irrelevant verbalization interferes with their performance. Under conditions of no verbalization fours learn reversals more slowly than older children (Kendler and Kendler, 1961). Variations in the discrimination problems introduce certain perceptual difficulties which interfere with initial or subsequent discriminations in children. Children make more errors when cards which contain training designs are striated rather than black in both the first and reversal tasks. When these background factors are corrected, four and one-half to five year olds take less time to reverse than three and one-half to four year olds (Gollin and Liss, 1962). They may attend to the various shapes of stimuli to the exclusion of black and white color when only the brightness dimension is relevant (Bernheim, 1967). Individual experimental analysis of discrimination performance is feasible with young children since a clear baseline performance level can be established. However, the pattern of discriminative performance differs from one child to another (Bijou, 1961). Developmental status is also a factor affecting discrimination learning along with training test arrangements (Gollin, 1966; Bernheim, 1967). Ability to make a conceptual shift and ability to correctly label overt responses increases with age. Speed of learning is a factor which operates at the four year level (Kastner, 1969). Fours can match letter like forms correctly but make a high number of perspective rotation and reversal errors. Errors of changes of line to curve are also relatively great at four. Maximum confusion occurs for the younger child regarding rotation-reversal, next line to curve, next perspective and topological errors. Overall errors decrease with age (Gibson and Others, 1962). In three and one-half to four year olds given overtraining on a visual discrimination task, the greater the overtraining the greater the negative transfer to the reversal task. With children four and one-half to five overtraining improves reversal learning. Delay between acquisition and reversal for the three and one-half to four group reduces the negative transfer but does not facilitate conditional discrimination (Gollin, 1964). Both visual and tactile discrimination learning problems are easier to solve when the relevant dimension is form rather than texture during training; however, no differences occurred later on the test problem according to modality of training (Blank and Klig, 1970). Non-reward conditions are more effective than merely rewarding correct responses in discrimination learning training with retarded children with MA's between two and one-half and four years (Riese and Lobb, 1967).

Number concepts of fours include such number names as 18, 19, 28, and 40. Thirteen of fourteen fours can name all of their numbers in serial order but may skip many numbers. Nine is the largest number name used by three year olds. Only one of fourteen four year olds can count backward, but more than one-half of fours can tell what number comes after a given number and only two of fourteen can tell the number before a given number. Two of fourteen threes and ten of fourteen fours can count six pennies. Ten of fourteen fours and no threes can count representations of objects. Twenty-eight percent of threes and 42 percent of fours can find three, four, or five objects from a group of twelve candles. Seventy percent of the threes and 92 percent of the fours can tell when there are enough straws for cups. Only 14 percent of the threes could understand the term "most," but at four the percentage rises to 92 (McDowell, 1962). At three and one-half, children can understand the concept of "more than" when the initial task is learned under conditions which are simple and when the number of objects in each set presented in pairs to the child is no more than three. Also, when the child's attention has been directed to the number dimension, in the simple situation, he seems to have very little difficulty transferring to the more complex stimuli (Ginsberg, 1969). Nonverbal training procedures are not effective in teaching mathematical concepts "fat" and "skinny" (Greenfield, 1968). On a relational learning task no children could verbalize the difference "bigger than" at the beginning of the experiment. After transposition training on a double discrimination task, under fives transposed no matter how far removed the transposition was on the size dimension (Johnson and Zava, 1960). Transposition from large and small size objects to intermediate size objects is learned easier by older fours than by younger fours and threes. Sex, condition, age, and IQ are all significant in the ability to transpose successfully (Caron, 1966). On a matrix classification task involving placement of name tags by color and sex, there is a significant relationship between age and accuracy. Scattergram plotting of color and sex scores shows a rise in correct color placement at fifty-two months for girls and fifty-six months for boys. Correct sex placement rises with age but much more slowly (Fisher and Others, 1969).

Clustering responses utilizing words from four conceptual categories (fruit, toys, clothing and utensils) increase over trials and over age levels between two and five. Serial ordering does not appear until at least age four (Rossi and Rossi, 1965). Threes are less willing than fours to give up an operating rule or response tendency in a two-choice guessing problem once it has been established. The relative tendency to alter a response is very prominent among the fours when they commit a mistake. Younger children just repeat the wrong choice (Kessen and Kessen, 1961). Fours are capable of fairly accurate proportion estimates on two-category problems but make much poorer estimates on three-category problems (Widom and Ginsburg, 1967).

In a structured experimental program designed to teach the concept of one-to-one correspondence, gains were significant in favor of the children in the structured program. Scores of the younger children were lower than those of the older children. Even though the children improved performance in one-to-one matching, they did not pass tests to give evidence of attainment of conservation (Deal, no date).

Creative processes.--Drawings of under fives are influenced by the kind of atmosphere established by the adult in the classroom. Drawings of children from classrooms that rank high in supportive discipline rated higher on the Goodenough Scale and when evaluated qualitatively (Reichenberg-Hackett, 1964). Drawings of fours are also influenced by observation of an adult model drawing a stylized house. Some of the details of the model's drawing which influenced the children were size, shape, and details. The children's houses became larger, more horizontal and had chimneys and windows. The children were not much affected by roof line, door, and smoke (Urbana and Pease, 1960-61).

Verbal and non-verbal divergent thinking abilities as measured by the Minnesota Test of Creative Thinking are not different among children who have had a language enrichment supplement to a regular nursery school program and children who experienced a regular nursery school program only (Paton, 1966). In a study of continuity of growth under a logical-structured approach to educational stimulation, children who entered the program at four showed continuity of creative growth in most respects at the end of second grade. Two discontinuities were found, figural originality and elaboration (Torrance and Philips, 1969).

Intelligence.--The onset of parent-child resemblance in intelligence as measured by the California Preschool Scales is apparent between the IQ's of mothers and daughters at age three and between the IQ's of mothers and sons at age five. Father-daughter and father-son resemblances follow the same pattern (Honzik, 1963).

In a comparative study of fours in five different programs (ameliorative, direct-verbal, Montessori, community-integrated, and traditional), at the end of the first year the ameliorative and direct-verbal groups were superior to the community-integrated and Montessori with the traditional in between. On initial IQ scores one-third of each class was at 100 or above. On the second test 92 percent in the ameliorative and 74 percent in the direct-verbal fell in this stratum, while only 31 to 54 percent in the other programs did. All five groups demonstrated initial deficiencies on three subtests of the ITPA: Vocal Encoding, Auditory-Vocal Automatic, and Auditory-Vocal Association. Ameliorative, traditional, and direct-verbal groups made eight to twelve months progression on Verbal-Encoding while the community integrated and Montessori obtained lower scores on test two than on test one. On Auditory-Vocal Automatic, the ameliorative made the greatest gain. On Auditory-Vocal Association only direct-verbal and ameliorative were not deficient on test two. There were no differences on reading readiness. Ameliorative and direct-verbal were higher on number readiness (Karnes, Hodgins, and Teska, 1969).

Fours enrolled in a program of personalized programming consisting of four experimental designs (motor class, auditory-language class, visual class and cognitive class) showed gains in more skill development area than the control group. Girls seemed to benefit more from attending either the experimental prekindergarten program or a good nursery school (Coffman and Dunlap, 1967). Nursery school children enrolled in Learning to Learn programs matched with controls on the basis of S-B, Sprigle School Readiness Screening Test, Seguin Form Board and Vocabulary Test of S-B and the ITPA made greater gains on the S-B and Vocal Encoding subtest of the ITPA than the control group. Differences were significant favoring the experimental group on all measures except the S-B IQ, the Auditory-Vocal Association subtest of the ITPA, the Seguin Form Board and picture ratings. Differences in pre and post ratings by parents and teachers measuring all intellectual development and emotional development were significant for the experimental group except parent's intellectual ratings. When comparing the differential effect of the program on the culturally deprived and the lower middle class children in this study, it was obvious that the lower middle class children are ahead at the end of the program, but they also started with higher pretest scores. The program results in greater improvement for the culturally deprived than for the lower middle class subjects. At the end of the program the culturally deprived children are functioning at a level much like that of the lower middle class children exposed to a traditional program (Sprigle and Sprigle, no date).

In an Autotelic Responsive program for threes with Spanish surnames, differences were found on the PPVT between the experimental group and the control group. Children from the experimental group who entered kindergarten were doing better than could be expected of children of their background in the judgment of their teachers (Nimnicht and Others, 1966).

Language.--Using an instrument designed to assess language comprehension without requiring language expression from the child, it has been found that all nouns in the test except half, fourth, and middle are comprehended by 60 percent of threes. Some verbs (jump, run, and eat) are understood at three, but others such as give are not understood until four to six years. Adverbs denoting position or direction in space, up and down, are understood by age three, while adjectives denoting the spatial relationship left and right are not understood until the age of six. Three prepositions (on, under, and in) are understood by three; the others (by, between, and in-front-of) are understood by four. Except for the contrast she/he and they, the grammatical categories of gender and number in pronouns is comprehended by 60 percent of the children by age four. Plural/singular contrasts marked by collection of nouns is comprehended by five, although when the singular is given as a stimulus word, 60 percent of the fours pass. Singular/plural contrasts of verbs, is and are, are not understood until six and one-half when the plural is given as the stimulus, but when the singular is given as the stimulus, the verbs are understood by 60 percent of fours. A noun phrase with two adjective modifiers is comprehended at three. Simple imperative sentences are understood at three; compound imperative at four to six. Mean language comprehension scores increase with age with significant differences between the age groups from three to four and one-half (Carrow, 1968). The comprehension of F when F is presented before Pr is more difficult than its comprehension when presented after Pr. F, Pr, and Pa are comprehensible to threes; however, F and Pa are comprehended when paired with each other but not when paired with Pr (Herriot, 1969).

In the ability to recall previously heard sentences which match previously seen pictures, there is an interaction of sentence type with age. Fours and fives, but not threes, understand active sentence types better than at least one other kind of sentence type. Fours are poorer on passive sentence types than on questions. Negative construction is the poorest of all sentence types in understanding. In production, however, negative construction is better than the question construction for the three, four and five groups. In complexity, children show increasing control over the sentence with a single sentence embedded in it. At three the control over the sentence with one sentence embedded in it does not differ from control of centered embedding and double embedding. The single embedded sentence is always poorer in production than the simple sentence. The biggest jump in production of the simple sentence is from three to five years (Gaer, 1969).

Fours show a tremendously large increase over threes in the number of times they use four transformations: negation, contraction, auxiliary "be," and conjunction. This suggests that fours expand sentences more often than threes by using the auxiliary "be" and by generating compound sentences. Fours also increase in the use of question, "got," auxiliary "have," and "so." Three additional differences in favor of fours were auxiliary "have," possessive and reflective. In terms of linguistic competency, first sentence rules seem to be those relating to phrase structure and are learned by two to three years. The second stage in learning the rules governing the generation of sentences seems to be that of simple transformations (Brannon, 1968).

In the threes' learning of the control of grammar, imitation is more correct than comprehension and production, and comprehension is more correct than production (Fraser, Bellugi, and Brown). Analysis of records of spontaneous speech, conversation with an adult and conversation with peers reveals that all structures used by adults to generate their sentences are found in the grammar of the three year old and are used consistently. Structures which are in the process of being acquired at three are also in this process at the first grade level. The structures which are restricted to a child's grammar occur infrequently (Menyuk, 1961). Language handicapped children can in a very brief training period learn to produce the standard comparative form of simple adjectives. There is no evidence of differential effectiveness of a deductive or inductive instructional sequence on this learning (Bryson and Stern, 1969). Eight months of treatment resulted in substantial progress in a blind, language disordered four year old in learning, imitating and producing speech meaningfully and spontaneously. Vocabulary and receptive language improved greatly (Wessell, 1969).

Memory.--In a short-term memory experiment involving a task in which fours matched a cue card to one of a set of eight cards turned upside down, the proportion of correct responses at a given position is a decreasing function of the number of items intervening between presentation of the item and its test on recall. More incorrect responses are committed for cards in positions six, seven, and eight. In case the initial response is wrong, the second response is made very near the first response (Atkinson, Hansen, and Bernbach, 1964). Threes who have had training in tracing patterns remember the critical elements of shape of the figures and draw back training and criterion figures more accurately than controls. On a post-posttest the experimental group continued to achieve higher scores, indicating that they are able to resist the process of forgetting (Kannegieter, 1970). Recall is related to CA, number of trials, and method of stimulus presentation. Fours tend to use concept reorganization or clustering more than serial order recall. Serial ordering appears during the fourth year. By four and one-half or five, there is no difference in recall scores (Rossi and Rossi, 1965; Rossi and Wittrock, 1967). Recall is also related to size of stimulus, recency of the presentation and organization of the stimuli. Serial recognition memory processes in young children are similar to those in adults. Retarded children do not perform in a manner different from normals except in their ability to make use of the organization of a list (Calfee, 1970). Fours maintain sequences without perceptual support (Pufall and Furth, 1966).

Mediational processes.--When fours trained on four geometric forms to match or not match three different sample stimuli were given a probe to evaluate the transfer effects of the training operation, they matched the probe sample after training to match and they mismatched the probe sample after training to mismatch. The unreinforced imitations were maintained only as long as other imitations are reinforced and attributed to transfer of training effects (Sherman, Saunders, and Brigham, 1970). Training on a similar task facilitates conceptual transfer in fours. Children given prior similar experience in an unstructured situation show transfer once they understand the task requirements (Clarke and Cooper, 1967). Transitivity in under fours is also shown when highly redundant stimuli are used (Campione and Others, 1968). Free choice selection of stimuli may be mediated by the attribute of complexity. Fours trained on a task of medium complexity select more complex stimuli when provided with free choice (May, 1963).

Intersensory transfer can be demonstrated in young children and is age dependent. Under fives trained on either of two lights were unable to transfer to auditory signals, but when they received training on both lights, they were able to make the transfer to auditory signals (Gardner and Judisch, 1965). Threes cannot transfer from one mode to another but fours and fives can. In general very few of these children can verbalize their success (Blank and Bridger, 1964). In a task consisting of pairs of pictures representing words that were not associated learned by experimental groups in a three-stage chaining paradigm, fours exhibit the effects of mediated facilitation by giving more correct responses to a third than controls. Clear evidence of mediation was obtained (Boat and Clifton, 1968). Ability to perform a differentiated behavioral sequence in response to a single preliminary verbal command increases with age. Between the ages of three and one-half and four and one-half 59 percent of the responses are correct.

As the child becomes older, he is able to show more flexibility of verbal over non-verbal learning (Beiswenger, 1968). Free word associations of threes and fours to stimulus nouns show the average child to exhibit more primitive responses while the average adult produces more responses of the logical type. The child's associations show more personal, more sound determined orientations and unrelated responses. In addition, children are unlikely to find themselves unable to produce any association to a word (Wertheim and Geiwitz, 1966).

Perceptual processes.--Under fives make more color than form choices to stimuli varying in amount of color and complexity of shape. There are more color responses when the figures are of solid colors instead of simple colored lines (Corah, 1966). Problems with both form and color relevant are solved more readily than those in which one dimension is relevant and the other constant (Hoffman, 1964).

Threes recognize figures presented in upright orientation better than those presented in the inverted orientation. Children from four and one-half up to five show better recognition for figures presented in the inverted orientation. Between four and four and one-half, children do not show a consistent effect of orientation, presumably because this group is in a state of transition. This development represents a marked change for the process of form perception. The focal part is perceived by the threes and the top part by fives. The effect of object orientation depends upon the nature of the figure and the age of the children (Braine, 1965). Recognition of inverted photographs improves with age. Only two out of fifty under fives identified the inverted photograph 100 percent of the time. Variability is also great at these ages. The variation is from 12 to 100 percent at three and 20 to 90 percent at four (Brooks and Goldstein, 1963).

An experimental group of threes given training in tracing various patterns drew back training figures and criterion figures more accurately than a control group who worked puzzles and play games instead of having specific training, leading to the conclusion that tactile stimulation, tactile tracing and manipulation are variables important to visual perception (Kannegieter, 1970). No sex differences are observed in response time or errors in the cognitive style of threes. Boys' errors are significantly correlated with response time but not with IQ. Girls' errors and response time are not correlated with each other, but errors are related to IQ. High IQ girls make fewer errors while no such relationship is evident for boys (Lewis and Others, 1968).

At the end of five months training on the Edison Responsive Environment under fives could type their names but no words. Results of the posttest were no different from the pretest. No SES differences were found (Steg, Mattleman, and Hammill, 1968). Montessori training was superior to conventional training on the Cincinnati Autonomy Test Battery. Montessori children also scored higher on field independence and task persistence. Because Montessori instructors found it difficult to manage youngsters in the youngest age bracket, each teacher moderated expectations for pupil industry, responsibility, and self-regulation in the direction of more permissive policy. For these younger children the control model was superior. Superior outcomes on the CATB were evident for the Montessori group but were less apparent for the average and above average perceptual achievers. In cognitive abilities, no justification was found for expecting one training approach to achieve better results than the other (Berger, 1970).

General cognitive.--Various forms of questions used to elicit information do not make a difference in children's scores on ability to conserve, but each age group (four to seven) is different from each other in their conservation responses. Further analysis with type of conservation tone and type of questions shows that for fours most conservation responses are made to questions involving prediction, then judgment, then explanation. Perceptual explanation decreases with age while symbolic explanation increases. Irrelevant and unexplained responses do not appear past age five (Pratoomraj and Johnson, 1966).

Acquisition of the concept of probability is a developmental phenomenon. At three years eleven months none of the children are able to pass either the verbal or non-verbal task. Non-verbal behavior of the threes is often consistent with the inference that he is responding to even probabilities (Davis, 1965). Children between the ages of two years six months and three years two months correctly discriminate the relative number of objects in two rows. Children between three years two months and four years six months indicate a longer row to have more objects. Children after four years six months again discriminate correctly. These results show the capacity for cognitive operations exists earlier than previously acknowledged (Mehler and Bever, 1967). Also, in an experiment in the conservation of number, the results based on performance of three, four and five year olds failed to confirm Piaget's concept of number perception (Sallee and Gray, 1963). In support of Piaget's concept, transitivity of length has been shown to be a function of increase in age. No fours showed transitivity of length, although the percentage of children who can increases between four and seven years (Smedslund, 1963). Under fives guided through the inquiry method to discover for themselves from their observation and discussion concepts concerning classification, reversibility and seriation were able to verbalize their explanations in an articulate way employing statements of reversibility at a level to be expected as a result of their training. Children who did not have any training showed little change in their explanatory level on the post-training test situations (Roeper and Sigel, 1966). Sophistication of the response in problem solving behavior increases with age. Differences are not significant between three and four but are significant between four and five (Smith and Roth, 1960).

Anglo five-year-old children of undesignated or mixed socioeconomic background

Ability, specific.--Reading skills show a clear progression during first year instruction, with children moving from initially zero-level competence to writing words from their reader or finding particular words with prompts by mid-year to word attack skills and clear recognition of word boundaries by late in the year (Reid, 1966). Children in a programmed approach to reading which emphasizes a carefully defined developmental progression of skills make fewer errors and as a result maintain a more constant level of motivation. Children receiving the look-and-say method make more initial errors, which apparently occasions some avoidance behavior, although as error percentage declines, motivation consistently increases (McDowell, Nunn, and McCutcheon, 1969).

Attentional processes.--Anglos aged five years four months to six years eleven months were given consistent or inconsistent motor pretraining of attention for discriminating B and D. During pretraining the inconsistently trained subjects make fewer correct responses than either the consistent group or a control group. On a transfer task both trained groups obtain fewer errors than do controls, and the consistently trained also exceed controls in number correct (Hendrickson and Muehl, 1962). Inconsistent training may thus be confusing but produce a satisfactory transfer to a narrowly defined criterion performance, although consistently managed attentional training is uniformly superior.

Concepts.--Children were interviewed three times in the course of their first school year to examine their concept of reading. They were in a first-year program of reading. A clear progression of concept development could be documented, with the children moving from no information or misinformation initially to a clear conception before year's end of some of the basics of written language (Reid, 1966). Anglo kindergarteners make greater absolute gains than Negroes but lesser relative gains in number concepts when both groups are compared to their respective controls (Baughman and Dahlstrom, 1968). Systematic instruction in mathematics which utilizes planned number experiments for fives is a significant factor in their development of number concepts (Carlisle, 1969). Locally prepared criterion tests appear to be more sensitive to the differences produced by such a program than do more globally-oriented standardized readiness tests.

Anglo kindergarteners who experience a buzzer for correct answers and a "wrong" for incorrect, or "right" for correct and a buzzer for incorrect during a pretraining phase, learn more rapidly on a new task with either combination than does a control group not experiencing pretraining. The second pretraining group learns faster than the first. Punished groups learn faster than rewarded groups (Offenbach and Meyer, 1964). The buzzer, however, appears to be more effective as a negative reinforcer and may explain the greater effectiveness of punishment in terms of its greater discriminability under these signal conditions.

Kindergarteners who receive discrimination training with letter-like forms do better than controls on a transfer task that requires extension of a concept. Best transfer occurs when dealing with unfamiliar stimuli which vary in familiar ways (resulting in fewest confusion errors); next best transfer occurs when dealing with familiar standards but new transformations (Pick, 1969). This may be attributable to the former case allowing more direct application of the concept to the transfer problem.

Creative processes.--When an object is seen and handled by fives, far more non-standard uses are given than when it is simply seen. Both methods of interacting with objects, however, result in the production of equal numbers of standard uses (Goodnow, 1969). Anglos are less fluent on an "unusual uses" test than are Negroes (Iscoe and Pierce-Jones, 1964).

Intelligence.--Negligible relations are present between IQ and paired-associate learning (Semler and Iscoe, 1963). Anglos who attend kindergarten show mean IQ increments over controls for both S-B and Primary Mental Abilities tests (Baughman and Dahlstrom, 1968). Anglos exceed Negroes on WISC full scale and verbal IQ (Iscoe and Pierce-

Jones, 1964).

Language.--Kindergarten attendance has only a slight effect on verbal comprehension of Anglos but substantial effect for Negroes. Non-attendance results in Anglos doing relatively better than Negroes (Baughman and Dahlstrom, 1968). These findings suggest that factors outside of school more uniformly affect the language of Anglos but not Negroes.

Mediational processes.--Differing conditions of discrimination training (i.e., conditions which emphasize similarity-dissimilarity of words versus tracing versus matching) do not differently affect a reading task, although similar words are more difficult to learn to read than are dissimilar, the former resulting in more errors (Jensen and King, 1970).

Memory.--Anglos outperform Negroes on paired-associate learning when stimuli are "similar." These differences in learning are independent of general intelligence (Semler and Iscoe, 1963). Using "words" created from strings of an artificial alphabet as stimuli, Anglos recall an associated English word more readily for pairings in which the strings are longer and thus provide more uniquely recognizable letter-events. But for transfer to new material, this is the less efficient condition because, unlike the short string which is recognized in its totality, if the the child has focused on a unique cue aspect, for the longer strings, that unique cue aspect may well be absent in the transfer task since it was only an incidental of the "word's" appearance (Samuels and Jeffrey, 1966). Mental age, calculated from general memory for names of pictured objects, is negatively related to errors of reproduction on the Bender-Gestalt test (Whipple and Maier, 1966). The span of immediate memory approaches an upper limit by five and one-half years, but the range of experiences which can be integrated by a series of operations does not (Potter, 1966).

Perceptual processes.--Kindergarten experience in contrast to non-kindergarten improves Bender-Gestalt performance (Whipple and Maier, 1966). During discrimination training for distinguishing words in a test, tracing is superior to matching and matching is superior to re-arranging words. These may be viewed as differing visual-perceptual-motor approaches to the same task (Jensen and King, 1970). Perceptual deficits and variant patterns of deficits are implicated in the differences between normal and mentally deficient children (Sapir and Wilson, 1967).

Fives use a "successive pattern matching" strategy when confronted with structured problems which require them to produce a pattern of lights (by pressing bulbs) to correspond exactly to a printed standard. that is continuously available for viewing. Because there is no invariant relation between grasping the correspondence between the model and the light-board, there may be a striking difference between recognition and reproduction. There must develop some interplay between the "image" and the action that it must guide before reproduction will occur. Whereas younger children search the light-board independent of alternative models, fives try out each model (hypothesis testing) successively, independent of what they have tested before or will test next, and try it out in its entirety against the board to see which one matches. The salient feature of this strategy is its concentration on on-pattern bulbs, redundant and informative alike (Olson, 1966).

Perceptual recognition of pictures of familiar objects in varying degrees of focus increases between four and five and one-half years. When only one leap from stimulus to hypothesis is required, fives do very well (i.e., when there is one simple object to be identified), but they lag further and further behind when more steps are required, as with more complex pictures of objects. Since immediate memory is now near its upper limt, this ceiling seems to be due less to immediate memory than to possible other factors, such as general fund of information. Fives show fragmentation in the unrelated hypotheses they offer when presented with new instances of a familiar category. Compared with fours, five and one-halfs show an increase in their spontaneous prerecognition verbalizations in mention of detail and attributes, both of which contribute to a decrease in disorganized behavior (Potter, 1966).

Kindergarteners who make next-event predictions in a two-color choice situation in which the more frequent event occurs 60 percent of the time, make more response alternations than do younger children in both motor and verbal response conditions (Green and Myers, 1968).

General cognitive.--Kindergarteners who are trained on transitivity problems (e.g., from knowing that A is greater than B and that B is greater than C, to infer that A is greater than C) show little evidence of learning, even under conditions which vastly increase transitivity functioning in older children (Younis and Furth, 1965).

Negro five-year-old children of undesignated or mixed socioeconomic background

Concepts.--Kindergarten attendance is associated with greatest relative gain among Negroes in number concepts (Baughman and Dahlstrom, 1968). Teaching kindergarteners to verbalize rules that define concepts does not increase performance above that produced by regular instruction (Keislar and Schutz, 1969).

Creative processes.--Negro children tend to be more fluent in response to an "unusual uses" measure of divergent thinking ability (Iscoe and Pierce-Jones, 1964).

Intelligence.--Race differences in IQ are greatest at five years between Negro and Anglo children. Intelligence does not relate for either race to performance on a paired-associate learning task which uses photographs rather than actual objects (Semler and Iscoe, 1963). Negroes are lower on WISC IQ (Iscoe and Pierce-Jones, 1964). When children of both races attend conventional kindergarten, the IQ gap between them widens, due to gains by Anglos but no comparable gains for Negroes as measured by S-B. But on Primary Mental Abilities, Negroes also improve relative to their controls and proportionately more than do Anglos in relation to their controls (Baughman and Dahlstrom, 1968).

Language.--Kindergarten has slight, nonsignificant effects on Anglo verbal comprehension, but Negroes make gains. For those not attending kindergarten, Negroes fall further behind Anglos (Baughman and Dahlstrom, 1968).

Memory.--Paired-associate learning with photographs as stimuli appears to be independent in kindergarten of IQ. Negroes' performance is below that of Anglos in a "similar" condition (Semler and Iscoe, 1963).

Five-year-old children of undesignated or mixed socioeconomic background, mixed ethnic background

Attentional processes.--Severely subnormal subjects of MA 65 months are relatively handicapped in paying attention to more than one dimension (Bryant, 1967). The most effective of various methods of evaluating children's attention to educational television segments is the introduction of a distractor (Palmer and Others, 1968).

Ability, specific.--These are most conveniently subgrouped by ability areas, beginning with reading. Within this a distinction is maintained by presenting, in order, studies involving no treatment, those with some short-term treatment, then year-long special treatments, and finally year-long or longer general treatments.

Children who drop in rank in reading progress between testings are more likely to have received negative comments from the teacher (McNeil, 1964). Self-correction of errors begins to become evident among fives who are learning to read (Clay, 1969). Teacher, psychologist, and psychiatrist raters who attempt to pre-identify children who will under- or over-achieve are better at spotting the underachievers (Cohen, 1963). On overall reading performance at the end of grade one, prematures do less well than full-term children (DeHirsch, Jansky, and Langford, 1966).

Among kindergarteners, those who are younger at school entrance achieve less than do older children over the ensuing school years, except that younger girls later surpass older boys of equal ability but do not surpass older girls (Gott, 1964). This conclusion about the advantage of entering kindergarten as an older rather than a younger child is borne out in other studies (Stahuber, 1961; Weiss, 1962).

However, when early admittance is based on mental ability, younger children generally achieve at a level commensurate with older children into the intermediate grades (Allen, 1968).

Children who receive a carefully sequenced series of reading skill development experiences and who are letter trained as compared with word trained to label cartoon animals, are clearly superior in transfering these skills to a related reading task than either word trained or controls. Median IQ children do best under letter training (Jeffrey and Samuels, 1967). Similarly, children who have pretraining with the letters which are constituents of words in a reading test are superior to a group pretrained on the same words as those appearing in the reading task or to a control group pretrained on geometric forms (King, 1964). Children pretaught to identify words and subsequently tested on picture-word matching items do not outperform a matched control group (Bereiter, 1967). Visual discrimination pretraining causes experimental subjects to outperform controls on a standard reading readiness test, with some evidence that LSES children especially profit (Wheelock and Silvaroli, 1967). In any event, instruction that is especially designed for transfer has a strong facilitating effect on phoneme-grapheme relationships (Dreyer, 1968). Word-recognition training is more successful in an unprompted versus a prompted condition, probably because prompted children are shown a picture but unprompted are not, with the result that the picture rather than the word may capture the child's attention (Duell, 1968). Kindergarteners can also learn to read when tutored by sixth graders (Frager and Stern, 1970).

Several programmed instruction procedures improve the ability of kindergarteners to test words, e.g., procedures of 1) deleting echoic stimuli, 2) deleting tactile stimuli, 3) using textual, intraverbal and tactual control of words along with additional stimuli in teaching other words of stories, 4) fading intraverbal stimuli in additional stages as in 3 above (McDowell, 1969). Letter-sound association with consonants also can be taught in a programmed curriculum for kindergarteners (Hubrig, 1967).

Systematic reading or reading skill programs in kindergarten have used a variety of approaches and materials. A "written" approach improves children's readiness in content areas as well as reading (Corliss, 1968). The direct verbal and ameliorative programs also use particular methods to accomplish specified outcomes. Both programs produce mean readiness levels considerably advanced (Karnes, Hodgins, and Teska, 1969), with some children reading at or above second grade level. Other programs which have emphasized direct reading for kindergarteners using a linguistic approach plus Dr. Seuss books show growth in ability to attack the reading process (Gruber, 1966), and those using a formal reading approach show an excelling in reading skills over children in either a reading readiness or traditional kindergarten (Chen and Others, 1965). This latter program does not, however, minimize IQ-related reading achievement differences, with low IQ children appearing to do somewhat better in regular readiness instruction (Kelley and Chen, 1967). Readiness has a similar effect to that of IQ on learning to read in a formal kindergarten reading program. This may explain in part why boys manifest an increase in negative social behaviors during a formal program (Mason and Prater, 1966), i.e., because their readiness is lower for this than is that of girls. Formal reading, evaluated only for overall groups, appears to advance readiness (Cooper, 1963).

Systematic readiness training in kindergarten, using workbooks plus teacher prepared materials, as compared with traditional kindergarten, is only marginally more effective than the latter in producing readiness, with much improvement being attributable to IQ variations. (Angus, 1962). When kindergarten and first grade readiness programs are compared, the former is at least as beneficial as the latter (Breon, 1967) for both boys and girls. Families which provide more visual and auditory language development stimulation through newspapers, recordings, and such have kindergarteners who benefit more from readiness training (Hernandez, 1965). A sleeper effect may also be present, with children in kindergarten or K-level readiness showing no immediate effects but evidencing an increment in readiness during first grade. Yet this does not guarantee greater reading skill at the end of first grade (Silberberg, 1967). Systematic use of workbooks during kindergarten readiness has been singled out as a source of accelerated readiness (Hellerick, 1965; Schoephoerster, Barnhart, and Loomis, 1966).

Introducing the initial teaching alphabet (ITA) for kindergarten as compared with first grade favors the former group at least as late as the end of second grade (Shapiro and Willford, 1969). The Edison Responsive Environment, used for about thirty hours per child on the average, leads to marked acceleration over same-school controls, and apparently benefits lower IQ children disproportionately, while minimizing differences between Negroes and Anglos (Martin, no date). Educational stimulation of creative thinking likewise improves readiness (Torrance and Aliotti, 1968). Montessori versus nursery school for fives, whose parents are assessed to be similar in many crucial respects, shows varied superiorities, depending on the variables examined.

Montessori children show more rapid solution of perceptual tasks and focus more on the physical characteristics of commonplace objects and free draw forms more often, whereas nursery schoolers describe objects in more functional ways and free draw persons more often (Dreyer and Rigler, 1969). One program designed for "emotionally deprived" children is difficult to evaluate rigorously because of the weak evaluation data collected, although the impression that is left is of a favorable outcome (Wichita Program, 1967). Conceptual-language classes for children from non-English speaking homes appear helpful (O'Donnell and Michael, 1967).

Compared to the foregoing, the more general programs are often associated with equivocal results. For example, few differences appear in specific measures between children who have and have not attended kindergarten (Rubin, 1969). No significant effect of regular kindergarten on reading is found at any grade from one through six, although there are hints of progress in other areas (Haines, 1961). Again, although diffuse evidence suggests a beneficial effect from non-specific kindergarten program attendance, reading readiness results are inconclusive (Kindergarten Research Study, 1967). On the other hand, a general two-year program of kindergarten is markedly more beneficial to achievement in grades two through six than is a one-year program (Brubaker, 1960).

Arithmetic development seems on the whole favorably affected by both specific and general programs, perhaps because the home is less likely to provide systematic stimulation in this area than in language skills. Arithmetic readiness, for example, is improved by a "written" program (Corliss, 1968). In 80 percent of comparisons made for arithmetic in grades two through six, older children outperform younger (Gott, 1964), providing clearer results than in the case of other academic skills of the mental age effect. About one-third of an unselected kindergarten group appears to be ready for organized work in arithmetic, with about one-fifth clearly unready. Kindergarten children appear ready to deal with mathematical instruction involving shape, size, relationships, and measurement, with about one-third ready to use these concepts in counting, grouping, enumerating, and reproducing numbers. Even without a systematic program, children show substantial gains in understanding numbers during the kindergarten year (Dutton, 1963). A general kindergarten effect on arithmetic is also reported by Haines (Haines, 1961).

Teaching selected science skills to kindergarteners, including observation, classification, data treatment, and measurement, appears feasible and beneficial to other academic skill readiness (Edwards, 1966).

In musical development, a gradual progression of harmonic discrimination is demonstrable in kindergarten through grade three. Having a music teacher, as compared with the regular kindergarten teacher, provide instruction improves children's harmonic discrimination. Kindergarteners are better at harmonic discrimination with an unknown than a well-known melody (Bridges, 1966).

Concepts.--Concepts are discussed in this section, first in relation to the curriculum, then to areas of the child's adaptation and orientation to the external world, followed by general conceptual ability or processes which facilitate concept formation, and finally with reference to dimensions and attributes along which conceptual behavior may vary.

Kindergarteners understand the mathematics-related concepts of tallest, circle, one-half, widest, and can identify many real numbers of less than twenty. Considerable incidental concept growth occurs during regular kindergarten (Dutton, 1963). Older children and children in an experimental program demonstrate a perception of one-to-one correspondence in their matching (Deal, no date). Beginning kindergarteners all have some facility in rote counting by one; 25 percent count by ten; half display some grasp of ordinal numbers (95% first, 70% middle and last, 50% second and fourth) and recognize and select small quantities of objects; a large percent understand to a high degree premeasurement concepts. Largest, smallest, tallest, longest, most, inside, beside, closest, and farthest are familiar to about 80 percent, while situations involving shortest, few, underneath, and some are known to 50 percent. Clock, calendar, and yardstick are ordered by children's decreasing familiarity. Units of coinage are vaguely grasped. Circle (91%), square (76%), one-half of something (50%), one-third (89%), one-fourth (66%) show rates of familiarity. Most can perform some simple addition and subtraction of concrete instances (Bjonerud, 1960). Williams (1964) substantially supports the foregoing for kindergarteners, adding that boys and girls do not differ overall; SES and MA affect results; the rate at which geometric concepts are learned is related to the number of representative models present at the moment that the stimulus is presented. Pentagon and right angle are apparently easier to learn than are acute and obtuse angles (Stoll, 1962). Radices are more easily taught to first grade than to kindergarten children. It may be feasible to teach radices to these children, although the data are insufficient to support the conclusion (Scott, 1963).

Entering kindergarteners can name certain processes, pieces of equipment, and animals presented to them in science learning. Fifty percent can induce a generalization from four separate elements presented in a random order. They do best when stimuli are of a concrete nature rather than verbal (Helfrich, 1964). Many children can use picture symbols to form a sentence. They do not yet grasp that a letter can represent a sound (Levin, 1966). Programming social science instruction increases these children's understanding of such basic concepts as "gulf." Their fund of information is more wide and varied than is usually credited. They use a wide variety of materials and experiences in developing concepts, e.g., play clarifies ideas. They deal with ideas over long periods of time, returning to them again and again to clarify, practice and modify them in line with new information. They use authentic simple maps to analyze geographic areas; concepts of sequential (not absolute) time to understand past events, and can transfer their concepts to new situations (Spodek, 1962).

Their experience with physicians and health practices has led to some concept formation as revealed in requested drawings. The physician is seen as helpful and positive appearing at bedside in house calls and hospital situations. Nurses appear infrequently (but were not specifically requested). What it means "to be healthy" is too abstract for kindergarteners to respond to. They do, nevertheless, show a concept of how one keeps healthy: food (25%), exercise (25%), and comginations of sun plus good food plus exercise or other combinations (33%) (Berger, 1960).

Kindergarten teachers, using special plans and materials, are more successful in imparting time telling concepts to children under planned than they are under incidental conditions. Sex differences are not evident in such learning. High IQ children learn more about time under either program (Stephens, 1964).

A general program for increasing the conceptual abilities of kindergarten and EMR children causes both of these groups to exceed their initial status on picture anomalies, embedded figures and object sorting, and causes kindergarteners to exceed their initial performance on stencil design. Appropriately selected control subjects make gains for picture anomalies among normal and for stencil design among retarded individuals (Corter and McKinney, 1966). After instruction, 90 percent can put pictures in series to tell a story (Levin, 1966). Among kindergarteners reversal is greater than non-reversal for mediators, and non-reversal exceeds reversal for nonmediators. When divided into fast and slow learners based on initial learning, fast learners show reversals more easily than non-reversals and slow learners do non-reversals better than reversals (Kendler and Kendler, 1959). Five-year-old boys use concrete word definitions predominantly, rather than abstract (Al-Issa, 1969). Fives and sixes who are asked to sort cards with pictures into two groups, singular and plural items, perform better when singularity-plurality is expressed in terms of single and multiple objects rather than when it is expressed in terms of duplicate features embedded in an object (Anisfeld, 1965).

In addition to the above characteristics and successes in teaching concepts, it is possible to indicate some of the conditions which are more favorable to concept attainment at age five. Rehearsing a concept rather than instance labels produces superior learning (Stern, 1965) when the stimuli are familiar objects. On a bidimensional classification task in which beakers of varying quality must be arranged into a two-dimensional display, children who have been trained on the relevant dimension perform better, although this is most helpful to more verbal and older subjects (Darnell and Bourne, 1970). For a two-choice situation, simultaneous followed by successive presentation appears highly effective as is successive followed by successive, but successive followed by simultaneous presentation is ineffective in producing discrimination (Jeffrey, 1961). Verbal stimuli which have been paired with primary reinforcers can lead to the establishment of secondary reinforcers strong enough to establish and maintain new behaviors (Fort, 1965). The advantage of this is that one thereafter eliminates the distractor effect of delivering the primary reinforcer.

That the perceptual relation of identity (one-to-one) can be established among fives is mentioned above (Deal, no date). An optimum set of conditions for teaching matching of letters first uses a warm-up period with stimulus attributes that are relevant to the targeted matching; then the child is instructed regarding concrete incentives that he will receive for each correct match and a more heavily weighted penalty which will be that he forfeits a set of the incentives for any incorrect match. This general treatment design provides both a clear definition of "same" and high motivation to attend to each item. Fives, under these conditions, in fact do as well as eights do under a less ideal training arrangement (Hall, 1967). With pseudowords of high and low confusibility, children who are high in reading readiness make fewer errors. Low confusibility words are judged in shorter decision times than high confusibility; vertically presented faster than horizontally displayed; and girls respond faster than boys. Fewer average errors occur when judging matched rather than unmatched pairs, probably because children are more likely to say "same" (53%) than "different" (47%) (Nodine and Hardt, 1970). With pretraining on matching, using the same words or different words or geometric forms, the sameness group later transfers more rapidly to learning a vocabulary list than does either other type of training (Muehl, 1960).

The so-called oddity problem requires simultaneous or sequential decisions regarding similarity and difference. On three-choice oddity problems using polygons, under reinforcement, decision time is less for eight-sided and more for polygons that are four-sided or greater than eight-sided. Apparently four-sided polygons are less free to be unique, so are less discriminable, whereas those exceeding eight sides increase rapidly in complexity (information load), making discrimination difficult (Brown and Goldstein, 1967), showing how various stimulus conditions affect the child's application of the concepts of similarity and difference. Oddity problems are handled better by fives to six and one-halfs in terms of correct responses and trials to criterion than by fours to fours, but not as well as by sixes to sevens, showing a developmental progression of conceptual ability (Gollin and Shirk, 1966).

Particular attributes or cue dimensions which have been studied in young children's conceptual behavior include color, size, form, texture, and brightness in various competing combinations. Ability to perform sorts involving reversal shifts improves following overtraining of color sorting and following initial training with difficult size sorting (Zach, 1964). Children trained with a white triangle and a white circle on either a black background or a striated background make more errors on a reversal task in the striated condition (Gollin and Liss, 1962). For fives the greatest amount of transfer occurs on a size problem, as compared to color and form (Scholnick, Osler, and Katzenellenbogen, 1968). Fours and younger fives classified as form or color responders do not perform differently on a form or color matching task. Among kindergarteners, form responders discriminate color better than do color responders, but the groups are equal on form discrimination (Corah, Jones, and Miller, 1966). At a mean CA of 70 months, trials to criterion on binary choices between any pairing of color-size-form decreases with increasing age, with optional reversal shifts less likely and numbers of trials to criterion being grater among kindergarteners than second or sixth graders (Kendler and Kendler, 1970).

On an optional shift task, using size and brightness, subjects initially overtrained (to 25 trials past criterion) make more reversal shifts. More optional shifts are made after variable than after constant irrelevant training (Eimas, 1969). Kindergarteners, tested for intradimensional reversal or non-reversal on problems involving complex, novel forms with texture as an irrelevant cue, show more reversal learning if "informed." Younger children do not show intradimensional shift (Blank, 1967). Five and one-half year olds, who are trained on either geometrical figures first followed by pictures of people second or the reverse order, generally learn the mediating concepts of dimension rather than specific solutions for problems. Positive transfer occurs between geometric problems and a subset of corresponding (color correspondence) people problems, suggesting that the children learn a general method of solving the problems. An all-or-none model is judged to be inadequate for representing discrimination learning at this age (Suppes and Rosenthal-Hill, 1968).

Creative processes.--Creative processes, as measured by the Torrance Test, are developed through planned educational stimulation (Torrance and Others, 1967), although results are not uniformly favorable, with controls outperforming experimentals in some creative behaviors (Torrance and Aliotti, 1968). A longitudinal follow-up in grades one and two of children who were in the program as fours and fives shows a continuity of creative growth throughout a three-year period, with a consistent increment in their use of elaboration, compared with controls. In fact, their elaboration at the end of grade two equals that of upper elementary and high school students. Children who enter at four do not show as uniform continuity of creative development as do fives (Torrance and Philips, 1969). Children given an opportunity to borrow and receive credit for ideas stimulated by a peer (so long as direct repetition of peer does not occur) do better than controls (working alone) on originality, but only slightly (Torrance, 1970). Both Montessori and conventional preschool programs likewise promote children's imaginative visual responses beyond those of a non-preschool group (Freyermuth, 1969). Various measures of playfulness and divergent thinking show consistent positive intercorrelations among preschoolers (Lieberman, 1964).

Intelligence.--Ameliorative and direct verbal instructed preschoolers have higher IQ than controls after one preschool year; direct verbal are superior at the end of kindergarten, but at the end of grade one the differences between these groups and controls disappear (Karnes, Hodgins, and Teska, 1969). One reason for such puzzling results may be the differential effect of preschool experience on the sexes. Girls, who may be more ready than boys, experience IQ gains in kindergarten, while boys do not. But younger boys in fact show greater acceleration of IQ than older boys (Borum and Livson, 1965). Younger boys seem from this to be more ready for the particular expectations that emerge in a kindergarten program or at least to have fewer competing behaviors to interfere with their progress. Perceptual training in kindergarten using a variety of marketed materials together with body concept instruction results in a ten point IQ gain, while controls decrease slightly (Ellerman and Wadley, 1970). In another kind of perceptual training, with children showing specific perceptual deficiencies (Bender-Gestalt), no gains of IQ are evident (Keim, 1970). This study also shows the S-B and PPVT tests to be only moderately positive in correlation. On a group intelligence test children who attend an "educational stimulation of creative thinking" program gain in verbal but not in nonverbal IQ (Torrance and Aliotti, 1968). Ten point IQ gains for normals and six point gains for EMR result from a program emphasizing the child's conceptual development (Corter and McKinney, 1966). Compulsory kindergarten for Israeli children of both high and low status of western and eastern ethnicity results in IQ gains (S-B) for all subgroups over their respective control conditions. Children of initially lower IQ show even greater gains than those with higher IQ, with similar but smaller tendencies among controls (Smilansky, 1964). Intellectual performance is not adversely affected by hyperbilirubinemia, which is treated by exchange transfusions, according to a five-year follow-up (Johnston and Others, 1967). Premature as compared to full-term infant delivery has a decidedly negative effect on IQ level and on subtler aspects of intellectual performance as well (DeHirsch, Jansky, and Langford, 1966).

Looking at the effects of intelligence on other aspects of the child's performance and development, another generally positive group of findings is manifest. Progress in kindergarten reading readiness is facilitated by higher IQ (Angus, 1962). For children who receive pretraining on synthetic letters and words, higher intelligence favors transfer to learning phoneme-grapheme relationships (Dreyer, 1968). Speech and language development of fives (Great Britain) likewise shows a positive influence of intelligence (Sampson, 1959; Lehman, 1967). Intelligence may interact, however, with particular instructional arrangements to favor lower ability children without being detrimental to higher or average ability groups. This is true of "conceptual language" instruction, which has mildly positive effects on higher and average ability pupils and greatly facilitates the progress of lower ability children (O'Donnell and Michael, 1968). Overall achievement records suggest that only a little over one-third of kindergarteners achieve at their expected level, based on IQ. IQ's of overachievers are highest, underachievers next, and achievers (children performing consistent with IQ level) lowest (Cohen, 1963). Other kinds of conceptual progress favorably affected by higher IQ are mathematical concept learning (Williams, 1964) and learning time concepts (Stephens, 1964), both among kindergarteners.

Language.--Ameliorative and direct verbal programs initially improve language proficiency. When children from ameliorative and traditional programs enter kindergarten, their language advantage begins to disappear, the same happening to the direct verbal group during first grade, so that by the end of grade one no persisting differences are evident (Karnes, Hodgins, and Teska, 1969). By five years, girls' language skills are further developed than boys'. Attendance or nonattendance of kindergarten does not appear to exert any special influence on children's language skills (Rubin, 1969). Some emphasis on readiness skills in kindergarten does, however, produce about 38 percent complete identification and naming of capital and lower-case letters by December and 58 percent by year's end. What is further evident is that family factors, personality, and the richness of the child's extra-classroom experience is reflected in his language (Lehman, 1967). A kindergarten program which emphasizes oral and conceptual language development systematically, compared to one which stresses convergent thinking and paper and pencil tasks, produces higher total scores on all nine subtests of the ITPA, but not on the language portions of a difficult reading readiness test (Milligan, 1965). Contributions which an activity program kindergarten can make to increasing children's language practice opportunities are most notable in discussion and housekeeping, judged from both quantity and maturity of speech used during these. For some children adult story hour and table activities show promise. Least helpful for language development are blocks, dance and woodworking. Looking at mature speech alone, the best activities are table activities, housekeeping, discussion, blocks and music. Overall factors which seem to influence the amount and maturity of speech are adult participation, opportunity to speak, something concrete to talk about, common experiences, theme-seating-position-spacing, models of speech, furnishing and area arrangement, and noise (Cowe, 1968). Oral language facility of kindergarteners is also predictable from a variety of other influences: television viewing, seashore play, museum trips, yard work, reading, domestic travel, bedtime stories, and pet care (McDaniel, 1968).

Reliability of various language scores, based on samples elicited with picture cards, is relatively low among five and one-half year olds over a three week period, with only mean length of response showing a somewhat higher reliability (Minifie, Darley, and Sherman, 1963). An analysis of spontaneous language samples of fives reveals that, in rounded figures, about 23 percent of their utterances are questions, 45 percent statements, 28 percent requests, and 2 percent each of exclamations and calls. Of all their questions 10 percent are formed by inversion of subject-verb order, 32 percent by using an auxiliary and inverting subject-auxiliary, 10 percent by use of a question word, 19 percent by a question words plus subject-verb inversion, 29 percent by use of a question word plus auxiliary plus inversion. Eighty-one percent of the questions would require a reply in either the noun-verb-adjective or noun-linking verb-noun statement patterns. Of the statements, 54 percent are of transitive verb pattern, 31 percent intransitive, 3 percent predicate adjective, 5 percent predicate nominative, 5 percent adverb pattern, and 2 percent "there" pattern. The children use most of the important sturctures of the English language, with nouns, verbs, determiners, and auxiliaries being most frequent. Adverbs, verb clusters, and p-groups are used more frequently than are adjectives and intensifiers, but all of these are used only occasionally (Carpenter, 1966).

Prematurely born children show subtle disturbances of both language production and comprehension (DeHirsch, Jansky, and Langford, 1966). Mongoloid children of CA five and six are clearly better in comprehension than in production, nearly all of them are combining words and using simple sentences by six years. None use words relating to spatial relations such as "in" or "on" (Thompson, 1963). Kindergarteners, listening to sentences through headphones with the instruction to repeat the word spoken when they hear a clicking sound, have a distinct tendency to prepose click positions for both sentences and non-sentences, but for older children the tendency is to post-position the click in the case of well-formed sentences (Miron, 1967).

Sentence comprehension of fives, to a special set of drawings which preclude the need to produce language, shows that adjectives of number or relative quantity generally are not understood until five and one-half years; adjectives denoting spatial relations left and right are not understood until six; contrast between an adjective constructed by adding "er" to a verb and the verb by five and one-half; neither/nor as negatives not until seven; and passive voice by five and one-half or six (Carrow, 1968). When fives and sixes hear a sentence and are shown a picture of it, being then asked to tell what they have heard, followed with candy if correct, active sentences and questions are understood equally well by five years, passives and questions are not differently understood, while the negative is most poorly understood. The order of types for production is the same, except that the negative is better than the question for fives. Center embedding and double embedding sentences are understood less well than simple sentences, with single embedding being intermediate. For production, the single embedding is poorer than the simple sentence with the remaining types being difficult and not different from each other (Gaer, 1969).

Children's comprehension of plural/singular contrasts, presented in that order, for a collection of nouns is evident by five years, although younger children can also handle the contrast if the order is singular/plural. For the irregularly inflected verb to be, appropriate contrasts between singular and plural are not understood until about six and one-half, if the more difficult order plural/singular is posed, with the child being asked to supply the latter term (Carrow, 1968). Kindergarteners having a mean age of around six years, who are shown pairs of pictures for which the experimenter names the singular and asks the child to assign the plural, at least append a number marker s on difficult items for which they cannot produce the standard plural form. Evidence also suggests that recognition and production procedures measure different aspects of the child's behavior and do not simply sample from more difficult processes that have the same underlying meaning (Anisfeld and Tucker, 1966). On a task that uses synthetic names for cartoon animals to mark singular and plural forms, providing corrective feedback to children just under six reduces overall errors as compared with no feedback. Errors in the plural/singular sequence are clearly larger in no-feedback, while in the singular/plural sequence the difference between feedback and no-feedback is slight (Bryant and Anisfeld, 1969). The implication from this independently replicated finding of the inherently greater difficulty of the plural/singular order is that children usually store names in the singular and then operate upon them with transformational rules to form the plural.

When asked questions about toys to measure their understanding of present, past, and future tense, children (Great Britain) do not comprehend the future until about age six when paired with the present, although if the future is paired with the past it is understood before five. Some fives understand the future paired with the present if additional grammatical and referential cues are present. The order of presentation future/present is still apparently more difficult than present/future at six years (Herriot, 1969). Again a transformational interpretation seems in order.

The language of boys (Great Britain) at five shows slightly greater precision while that of girls shows greater fluency of expression (Sampson, 1959). Boys at five show a predominance of concreteness in their definitions of words (Al-Issa, 1969). Kindergarten children have a minimal vocabulary of 3728 words, most frequently using I, a, in, is, it, it's, mine, the, to, you in their speaking vocabulary. They understand about 97 percent of the basal reading vocabulary used in first grade reading books (Kolson, 1961).

Memory.--Mentally retarded children show a higher relationship between memory and arithmetic performance than do normals (Rice, 1968). Severely subnormal children are relatively unable to attend to more than one dimension (Bryant, 1967), showing a basic memory problem for processing two or more dimensions. Fours cannot maintain sequences without perceptual support, but most fives and sixes can (Pufall and Furth, 1966).

Kindergarteners reproduce a serial order display better after six months than they do immediately following presentation (Dahlem, 1969). This finding is essentially replicated over six months for reproduction of a patterned or ordered array of sticks by kindergarteners (Altemeyer, Fulton, and Berney, 1969). For recognition of objects which children have been trained to recognize and which are later shown in varying degrees of completeness during testing, a non-significant decline in mean recognition scores occurs as delay between training and test increases from one to two to four days (Gollin, 1961). Children pretested as having high or average immediate memory span show clear cue position selection patterns operating, but children of low memory span appear to behave randomly in their selection of visual cues (Weissglass, 1966).

Fives remember more recent items of a series better when they engage in overt labelling of the stimulus items. Children who engage in overt labelling perform better than those who do not. Spontaneous use of reversal strategy is not widespread among kindergarten and nursery school children (Kingsley and Hagen, 1968). But fives who are given a memory aid do no better than those not given a memory aid (Weir, 1967). Prompting and confirmation do not differentially affect correct responses of kindergarteners on a paired-associate task (Evans and Banks, 1966).

Mediational processes.--Mediational activities are not directly observable, but are inferentially observable from performance variations that fit a predictable pattern. In this sense, several studies that appear in other sections by implication are also suggestive of mediation, as is patently evident from those dealing with concepts, language and perceptual processes. Complete cross-referencing, beyond the intent of the original investigators, lies outside the scope of the present report, although the reader will find this to be a productive byway to examine regarding mediation.

Ninety percent of kindergarteners can arrange pictures sequentially to tell stories (Levin, 1966). Among prematurely born children, subtle dysfunctions seem to persist into kindergarten and later in those aspects of the learning process which like reading, writing and spelling require a high degree of differentiation and integration (DeHirsch, Jansky, and Langford, 1966). Transformational operations performed by children from five onward on increasingly complex sentences and using more difficult transformations, e.g., forming negative, passive, question, degrees of embeddedness, plurality, and tense forms in sentences, are clearly aspects of their growing mediational prowess (Anisfeld and Tucker, 1966; Bryant and Anisfeld, 1969; Gaer, 1969; Herriot, 1969). Kindergarteners who label recall better than those who do not label when learning a word list. Clustering of words into conceptual categories occurs more when words are presented visually or audiovisually than when presented auditorially. Clustering also increases from first to third presentations. Kindergarteners already show as much clustering as do third graders (Horowitz, 1969). Fives who are asked to verbalize a solution but provided with no additional feedback do better than controls in concept matching tasks for equivalence but are not different on crossmodal transfer. Those who are asked to verbalize, to attend to attributes, and who are informed if they make a correct response, perform training and transfer trials so efficiently as to preclude any formal test of transfer (Blank and Bridger, 1964). This kind of finding suggests that the main problem that is overcome by the treatment is one of mediator production. Secondary reinforcement apparently interferes with mediational processes by providing cues which disrupt the child's ability to discriminate between training (when primary reinforcement is present, along with secondary) and a transfer test (when primary reinforcement is absent) (Myers and Myers, 1966). Nonverbal mediator production by kindergarteners is apparently low, since, as compared with controls, those who are helped to see how to use paper forms as memory aids to duplicating a patterned, wooden form display do better in duplicating the display. This increment does not occur for first graders, for whom production is apparently not as much of a problem. That it is a question of availability rather than actual possession of the skill is clear in that all children demonstrate the ability to make and use a model (Corsini, Pick, and Flavell, 1968). Regulation of behavior by language provides another instance of mediated behavior, as when children are told to be motorically guided by some verbal rule, such as "when the red light flashes, push down; when the green light flashes, don't push down." Under such conditions 96 percent correct responses are shown by five and one-half to six and one-halfs but only 59 percent correct by children of three and one-half to four and one-half years. Once verbal control exists, it is easy for the child to respond immediately and without practice even to stimuli when the signals' meanings are reversed. The ability of a sentence of the above complexity to regulate the child's ensuing behavior begins around four and is achieved by all normal children by six (Beiswenger, 1968). This again provides evidence of the greater flexibility or reversibility along defined dimensions of the child's behavior as a function of mediational development.

Perceptual processes.--Visual discrimination pretraining improves performance on both a reading readiness test and a letter-form training task (Wheelock and Silvaroli, 1967). Children from differing environments show initial differences in visual discrimination ability (Wheelock and Silvaroli, 1967). Kindergarteners who receive training with shape and letter differences which are pertinent to a transfer task do more poorly than ones given training in letter differences only, but these differences are not evident on a reading task (Muehl, 1961). Visual-motor training of children with positive Bender-Gestalt signs produces small gains in reading readiness (Keim, 1970). Children, who receive kindergarten perceptual training, based on a variety of training approaches and material and integrated into a traditional curriculum perform better in first grade on a difficult readiness test (Faustman, 1967). Another perceptual training program shows a mild reading readiness effect for kindergarteners, with the Frostig test appearing strongly to predict readiness scores a year later (Roy and Roy, 1968).

A short-term instructional treatment for fives and sixes on recognizing depth cues causes trained fives to outperform untrained sixes, even though untrained sixes outperform untrained fives (Edwards, 1970).

Threes do not transfer from the visual to the auditory mode but fours and fives do. Both cueing and more thoroughly informing fours and fives improve transfer during training, but only informed children transfer their prior cross-modal performances (Blank and Bridger, 1964). Fives better recall words previously experienced visually or audiovisually than those experienced auditorially. The former two groups also show more conceptual clustering of words than does the latter (Horowitz, 1969). Auditory discrimination and articulation appear to be unrelated among kindergarteners, although auditory discrimination is positively related to speech muscular coordination (Sandy, 1966). Fives (Russia) who explore a concealed form tactually use both hands, moving them in opposite directions but usually confining themselves to careful examination of specfic features of the figure.. Sixes show more systematic tracing with their fingertips, while under fives show less efficient exploratory contact. Despite these differences in examination procedures, younger and older children are more comparable in their accuracy of tactual recognition than they are for visual exploration. Eye movements of fives and sixes again show an increased efficiency of exploratory activities compared to those of younger children. These older children show almost errorless performance in the visual condition, but younger children show high error rates (Zaporozhets, 1965). Intersensory judgments of equivalence of stimuli presented in either visual and/or haptic and/or kinesthetic modes show fives and sevens to be almost the same for the former two in combination. For visual-kinesthetic and haptic-kinesthetic combinations, fives do quite poorly in comparison to older children. Intersensory judgments of non-identical forms show less sharp inter-modal contrasts, with visual-haptic still being the most efficient, haptic-kinesthetic intermediate and visual-kinesthetic most difficult, and with age trends present as before but less marked for the two more difficult processes (Birch and Lefford, 1963). Intersensory transfer between visual and auditory modes of training on perceiving the duration of an inter-stimulus interval, show auditory signals are overestimated consistently across three brief intervals, whereas for visual signals short intervals are slightly overestimated and a longer interval (4.5 seconds) is substantially underestimated. Age differences beyond five years are not evident (Gardner and Judisch, 1965). For rhythm of on-off-on sequence of either a light or tone, a greater average error exists for visual than auditory intervals indicating rhythm. Amount of error is a decreasing function of increasing age from five onward for either modality. Taken with the earlier study above, this shows test ability to make judgments of isolated time intervals becomes stabilized at an earlier age than does ability to reproduce a patterned rhythmic stimulus (Gardner, 1968).

The recognition of the identity of two stimuli is another aspect of development which is frequently investigated. Children who are trained in letter matching markedly outperform a control group on a group of tests (Koppman and LaPray, 1969). Fives and sixes perform better on a task of learning singularity-plurality when this distinction is illustrated in terms of multiple objects rather than in terms of multiple embedded parts of a single object. Apparently the imposing presence of the object as a whole interferes with responses based on the characteristics of its parts at this age (Anisfeld, 1965). Of prereading kindergarteners, 56 percent make near perfect scores on identification of matched and unmatched pseudoword pairs of either high or low confusibility. Fewer average errors occur for judging matched than unmatched pairs, because of a bias to say "same" 53 percent of the time. Low confusibility pairs are more rapidly judged. Decision times are faster with a vertical than with a horizontal presentation. Girls respond faster than do boys (Nodine and Hardt, 1970). Kindergarteners match identical letters after pretraining on form. Letter size does not substantially affect performance (Hall, 1967). Fives (Poland) show 93 percent accuracy in visual recognition of a cue that is moved through several spatial transformations before the judgment is made. Threes behave near chance, thus showing a rapid linear increase from three to five (Babska, 1965). Fours and fives recognize photographs of familiar objects in varying degrees of focus with about equal facility, so their combined results are reported together here. Their success is unaffected by high versus low viewing angle and by minimal versus maximal background information. Fours and fives require greater image resolution by focusing before they recognize familiar objects than do nines (Garloff, 1969). Similarity judgments of line (using circles, lines, triangles, angles, circles with dots) among fives reveal that they do not identify relevant dimensions as regards triangle and circle with dots, that they make more similarity judgments in the case of clear as opposed to ambiguous instructions, and that the absence or presence of contrast does not affect the results (Ginsberg and Gamlin, 1967).

The reorientation of photographed faces into inverted position produces lower recognition among preschoolers than for older children. Only two percent of fives identify the inverted faces 100 percent correctly, with correctness ranging from 33 to 100 percent (Brooks and

Goldstein, 1963). Kindergarteners and first graders make more position responses (errors) than do older children in the perception of horizontal-vertical relationships. Kindergarteners show few correct responses compared to the other grades (Davol and Hastings, 1967). Five and one-halfs (Great Britain) who perform poorly on the Bender-Gestalt commonly show impairment of the spatical organization of voluntary movement (Wedell and Horne, 1969). First graders and boys do better than kindergarteners and girls, respectively, in the discrimination of mirror-image reversals. Children improve over trials, except when receiving no correction during same-different judgments (Cronin, 1966).

Attention to perceptual cues by their spatial or temporal position appears to be another important determinant of learning and performance. Kindergarteners who are recalling five-letter nonsense words attend more to cue positions 1, 3, 5, 2, 4 in that order for boys and 1, 5, 3, 2, 4, in that order for girls. Cue _1_ is used more than chance and cue _4_ less than chance. Middle and high memory ability children show predictable cue selection, while low memory span children select cues nearly at random (Weissglass, 1966). Quite comparable results are also obtained for word recognition by position of letter cues, with first letter being most used by both non-readers and beginning readers, and the last letter second most used. The least used cue is shape in three-letter and five-letter strings. Recognition appears to be based on individual letters rather than on word shape (Marchbanks and Levin, 1965).

General cognitive.--The conception of left-right from five up to seven or eight years is marked by over or under differentiation of right-left (Elkind, 1961). The type of questions that are posed to combined fours, fives, sixes and sevens regarding conservation seems not to affect their responses. Each of these age groups differs from the other in amount of conservation. Fours and fives show more conservation to questions inviting prediction than to those calling for explanation or judgment. For older children these differences disappear. Their explanations show a decrease of perceptual and an increase of symbolic replies, while irrelevant and unexplained responses disappear past age five (Pratoomraj and Johnson, 1966). Mass, weight, and volume, in that order, emerge as properties which children conserve between kindergarten and grade six. Fives and sixes differ from older children for mass; fives through eights from older for weight, and fives through tens from older for volume. "Romancing" and perceptual explanation decreases with age while specific explanations increase between ages five and six (Elkind, 1961). A training program to influence children's conception of specific gravity is successful among kindergarteners but not first graders (Ojemann and Pritchett, 1963). Conservation of the shape property can be elicited in a majority of fives, in the sense of correct differential responses to real and phenomenal shape properties, following training (Braine and Shanks, 1965). No fours show transitivity of length, only 8 percent at five, and 23 percent at six (Smedslund, 1963). Illusion-distorted length is more often conserved by children over than under seven (Murray, 1967).

Conservation of number is not modifiable by a variety of reinforcement and cognitive structuring procedures among kindergarteners. There is a tendency to regard a longer row as more numerous (Wohlwill and Lowe, 1962). Conservation of numerousness can be modified among kindergarteners, however, under special conditions (twelve special lessons), but first graders are unaffected, since many of them already conserve (Harper and Steffe, 1968). The progression of conservation among Nigerian tribal children is similar to that among Europeans and other westerners, with a shift from purely perceptual to conceptual reliance occurring at almost the same age as for westerners (Price-Williams, 1961).

Anglo children of undesignated or mixed socioeconomic background, mixed ages

Attentional processes.--When familiarized and non-familiarized stimuli are presented in pair-wise fashion to Anglo preschool children, the children indicate a preference for the non-familiarized stimuli over the familiarized stimuli (Cantor and Kulose, 1969). Incongruity and color are effective variables for the study of perceptual and investigatory responses. Responses of fours and fives are not positively influenced by relative uncertainty of tachistoscopic exposures in response to their one word requests whereas identical experiments with adults have been found to produce positive results. The response curve for repeated exposure to stimuli is a negatively accelerated, decreasing one, indicative of drive reduction, habituation or fatigue (Clapp and Eichorn, 1965). Analysis of errors on a discrimination learning task indicates that Anglo preschool children acquire the win-stay, lose-shift strategy during pretraining on a learning set problem (Reese, 1965).

Ability, specific.--Canadian fours and fives, given the Reading Skill and Information Test, have only vague ideas of how people read, have difficulty understanding the purpose of written language and have special difficulty in understanding abstract terms (Downing, 1969).

The difference between the mean third grade reading scores on Iowa Tests of Basic Skills of Canadian children who had highly differentiated analytical perception and those who had less differentiated analytical perception in kindergarten as measured by the Block Design subtest of the WISC is not significant. There is a positive correlation in all cases between reading level and IQ and more highly developed differentiated analytic perception but reading level cannot be safely predicted on the basis of kindergarten level of differentiated analytical perception (Marantz, 1967). Reading readiness as measured by the Metropolitan Readiness Test is associated with greater preference for mothers among girls and among Anglos, less identification with teacher among boys and greater realism for size among Anglos. Father preference among Anglos is not related to readiness when preschool education is controlled (Henderson and Long, no date).

Concepts.--In a modified match-to-sample color task, four- and five-year-old Anglos who can respond to produce either similarity or dissimilarity maximize the occurrence of similarity, but those who can only produce dissimilarity can maximize neither of the combinations of standard and key color unless explicitly instructed to produce these conditions (Parton and Fouts, 1969).

Creative processes.--On the Starkweather Originality Test, oldest and only children make higher mean scores than later born preschool children. MSES children have higher originality than LSES children (Lichtenwalner and Maxwell, 1969).

Intelligence.--Anglos of mixed SES are superior to Negroes in performance on the verbal and full scale of the WISC. On ideational flexibility there are no age or race differences and no systematic increases in flexibility. Divergent thinking is correlated with WISC information, Vocabulary, Digit-Span, Verbal IQ, and Full Scale IQ (Iscoe and Pierce-Jones, 1964). During the first year of the Appalachia program children in all treatment groups made gains of 8.4 IQ points on the PPVT. IQ gains were not different for the four different treatment groups. It was estimated that cognition increased 36 percent. The television group was higher than the control group. Television plus home visitor was higher than the television group only. No differences were found between the group receiving all three elements of the program and the group receiving only television and home visits (Alford, 1969). A year later no claim is made that the program improves intelligence (Ranson, 1970).

Anglo children who have attended non-public kindergarten are superior to nonkindergarten groups on the Pintner-Cunningham Test of Primary Mental Abilities in reading readiness, total readiness, arithmetic readiness, number achievement as well as in maturity rating by teachers and scholarship average during the first grade (Olson, 1962). On the S-B there are no real differences between Anglo children who are brought to the center five days a week for training and whose mothers came to the center once a week for training and were visited at home to stimulate newly learned skills and children who are given the same kind of curriculum but with nothing planned for the family. Children in these two groups are superior to children in the home visitor group whose mothers are shown at home how to use certain techniques with the child. Similar results are found on the PPVT (Gray, 1970).

Language.--Psycholinguistic development during early and middle childhood on the ITPA and S-B clearly substantiate the differentiation hypothesis with respect to each one of its three possible deductions: 1) continuous decrease in the percentage of variance attributed to the general factor as age increases, 2) gradual increment in the percentage of variance contributed by group factors with increasing age, and 3) gradual decline with the interdependence of factors in the older age groups (Quereshi, 1967). The Appalachia program produces language growth in the children enrolled. Those in groups exposed to three aspects of the program--television, home visitor and mobile classroom--made more growth than those who received only part of the three aspects (Alford, 1969).

Mediational processes.--In a two-choice situation involving either motor or verbal responding of nursery school and kindergarten children, all groups made about the same proportion of predictions of the most frequent event. The mode of response did not affect response alternation. The number of response alternations was better for kindergarten children (Green and Myers, 1968). Sixty-one and one-half percent of preschool children pretrained on human pictures give a human response to Bugelski's rat-man ambiguous figure compared to 38.5 percent of children who were shown human figures but who were not pretrained. While mediation occurred in 61.5 percent of the children in the perceptual set task, it occurred in all children who were in the subgroup who had previously participated in the learning set task. The occurrence of mediation maximized reward in the learning set task but is irrelevant to successful performance in the perceptual set task (Reese, 1965).

Perceptual processes.--Figure-ground discrimination as measured by the ability to distinguish figures, some light on a dark ground and some dark on a light ground, improves with age between 34 and 63 months. There are no differences between the number of correct responses to dark-on-light and light-on-dark (Johannsen, 1960). Play experience with 3-D letters appears to increase printed letter discriminations of 34-month to 64-month-old Anglo children as effectively as play with 2-D printed letters. When 2-D and 3-D tasks are alternated, consistently fewer discriminations are made on the 3-D task. The 3-D task appeared to reduce errors on the subsequent 2-D task but the 2-D experience did not reduce errors on the subsequent 3-D task (Thornburg and Fisher, 1970). Among children three and one-half to five and one-half years old, meaningful factors have been found which suggest that distinguishable common cognitive style dimensions exist which seem related but not identical to that found at older ages. The groups that have been identified are impulsivity, control and inhibition in response production, rated social behavior, and general ability (Nadeau, 1969).

General cognitive.--After training in multiple classification and reversibility, fours and fives increased their ability to conserve correctly and their ability to verbalize underlying operations and the salient dimensions of the criterion test situation (Sigel, Roeper, and Hooper, 1966). More investigatory responses and correct discriminations are produces by six year olds than younger children to illusory and ambiguous stimuli. If four to six year olds are trained to perform investigatory responses on an initial discrimination task, positive transfer occurs at all ages. Spontaneous performance of investigatory responses are found to be associated with ability to distinguish real and phenomenal properties of stimuli, but not with conservation of length (Daehler, 1970). In a follow-up study of some aspects of the work of

Piaget and Inhelder on the child's concept of space, no evidence was found that topological shapes are identified more easily than euclidean shapes which have curved edges. As a whole data did not support Piaget's view that up to four years of age children cannot distinguish between a circle, square and an ellipse because they are all closed figures. In a further experiment topological properties were better displayed in children's drawings than were euclidean properties if figures were taken as a whole. Results of additional experiments agreed with Piaget's hypothesis regarding development of "correspondence" and tying knots; 53 percent of the children were able to make a straight line (Lovell, 1959).

The ability of blindfolded four to ten year olds to solve a problem involving the ability to locate a target peg located between two or three landmark pegs increases with age. Two-thirds of fours were unable to solve the original problem and none solved it within the first two trials. By age five 9.5 percent solved one of the first two trials, and by age eight 50 percent were able to solve one of the first two trials. Some of the children who were able to verbalize the solution did not utilize it while others who were unable to verbalize the solution were nevertheless able to use it. Verbal hints were largely ineffective, but actual placement of the child's hands on the landmark pegs often led to immediate solution (Feinberg and Laycock, 1964).

Negro children of undesignated or mixed socioeconomic background, mixed ages

Ability, specific.--On the Metropolitan Readiness Test Negroes obtain lower scores than Anglos. The three best predictors of readiness are preschool education, teachers' rating, and CA. Father presence is also related to readiness when preschool education is controlled. Negroes have lower esteem, less preschool education, less preference for father, and fewer fathers present in the home. Two variables, preference for mother among girls and distance from teacher among boys, are related to readiness when preschool education is controlled and appear to be indicative of social maturity at this age (Henderson and Long, no date).

__Intelligence__.--Negroes aged five to nine make lower scores on verbal and full scale performance of the WISC. No age or race difference is found on Ideational Flexibility. For Negroes only Vocabulary, Picture Completion and Full Scale are related (Iscoe and Pierce-Jones, 1964).

__Language__.--Negro children between three and one-half and six and one-half do not retell a story just heard more accurately or more abundantly using a Negro as a hero (a version of __One of These Days__) than a story without a Negro hero. Negro children are more verbose than Spanish children, but there were no ethnic differences in story relevant inferred phrases. Negro and Mexican children produce more action stories than Puerto Rican, Navajo and Sioux children (John and Berney, 1967).

__Children of undesignated or mixed socioeconomic background, mixed ages, and mixed ethnic background__

__Attentional processes__.--Preschool retarded children who are trained in focusing attention show greater capacity to assimilate and use guidance when compared to controls. Although IQ is related to pre-evaluation scores, it does not determine performance. IQ is not related to difference scores or to capacity to assimilate and make use of coaching (Santostefano and Stayton, 1967).

Ability, specific.--Follow-up studies of children who have attained reading proficiency before entering first grade indicate that these children have above average reading achievement at least as high as third grade (Sutton, 1968; McCracken, 1966; Durkin, 1966). The average achievement of early readers is higher than that for comparably bright non-early readers. The higher the IQ the greater the advantage of early reading when difference scores of achievement and IQ are examined year after year. Over a three-year period the advantage of an early start increases for the less bright but decreases for the brightest children (Durkin, 1966). Early reading is associated with such factors as early walking, early talking, father's education and personality of an older sibling in the home (Sutton, 1968; Durkin, 1966). Recognition of vocabulary is somewhat of a problem in first grade, but early readers quickly master word pronouncing and oral reading skills (McCracken, 1966). Children who read at primer level when entering first grade were all children who were read to extensively and had personal interest in reading. They noticed signs and asked about words, letters, and numbers. A high percentage of the children were taught to read either at home or in kindergarten. The mean IQ of this group was 128. They came from homes in which the fathers were skilled workmen, clerical workers, or professional workers and most of the mothers did not work. Over two-thirds of these children had older brothers and sisters (Plessas and Oakes, 1964). Kindergarten children who are given systematic instruction in reading skills in kindergarten appear to be more able to recognize letter forms, letter names, and to associate letter sounds than children who are given a reading readiness program in kindergarten. They maintain their reading skills during the summer and continue to be better readers in first grade. A similar program conducted by parents using a special guidebook and television instruction for at least thirty minutes a week combined with reading to the child for at least an hour per week was also found to be effective in teaching beginning reading skills to children who have a MA of at least four and one-half. The amount learned is directly related to the amoung of time someone practices related skills with the child (Brzeinski, 1964). However, there is not always a positive relationship between prior experience and grade four reading achievement and sometimes the relationship between cultural and environmental data reported by parents shows scattered significance. Reading at fourth grade is related to kindergarten teacher judgments and mental maturity, memory discrimination, motor control, specific adjustment behaviors, interest in books and reading, and work habits (Tyler, 1967).

In schools in which the overwhelming majority of children read below grade level, Negro and Puerto Rican children who had been enrolled in day care have mean scores nine months below grade level whereas the mean scores for all children tested are one year and one month below grade level at third grade. A curious finding is that the proportion of day care children who score at or above grade level declines the older the children are when tested but the trend for agemates is reversed. No differences appeared in schools which had different proportions of Negroes and Puerto Ricans (Wolff and Stein, 1966). A follow-up of a Head Start group in kindergarten showed similar results for both Head Start and non-Head Start children on a goal card used in both programs.

This could be construed to be a positive result if the assumption is made that the Head Start children were lower in the beginning because they came from lower income families. The lowest one-fourth of Head Start children showed a higher readiness score than the corresponding group from the non-Head Start population (Jacobs, 1967). Overall results of a comparison of mixed SES fours and fives who were enrolled in a kindergarten program and those who did not attend kindergarten show that growth in school readiness and language skills of children who attended kindergarten cannot be attributed to the normal kindergarten experience (Rubin, 1969).

Children admitted to school at early, normal and late ages do not show differences between groups on the Metropolitan Achievement Test, on academic ratings and on non-academic ratings of general behavior. Pupils admitted at an early age rated as highly at fifth grade as others. Only 8 percent of early age parents were against the program in any way but 63 percent of the late age children were unfavorable to the program. All parents saw their children's adjustment to school as good. In general both teachers who had early age children in grade one and those who did not have early age children were unfavorable to the program. There were no differences in referrals, except more for early age in grade one, and no differences in MA or IQ (Braga, 1969). Early entrance to kindergarten will not, in itself, cause first grade adjustment and achievement problems. Adjustment and achievement problems which may occur in early entrants are not a result of CA but of a combination of factors. MA and SES are related to success in first grade. CA is also related to success in first grade but other factors have stronger relationships. School adjustment and achievement are interrelated

(Loughlin, 1966).

Deaf children who have had the benefit of preschool training do not exhibit higher levels of achievement in language arts, arithmetic concepts, and social adjustment in their first year of primary school than a comparable group of deaf children who have not had preschool experience (Phillips, 1964).

Concepts.--Children with MA equivalents of 37 to 87 months improved in number concepts and in small game skills as a result of small game experiences. All children were able to count by rote to ten, enumerate eight objects, use ordinal numbers to five, recognize small groups to four or more, pair members of one set of objects with those of another, recognize common shapes, identify all United States coins, identify colors, and use quantitative vocabulary (Ross, 1970). Both younger and older preschool children benefit from instruction in conceptual understanding of number and clock time. Retention after one month is better for the younger children (Tajima, 1964). Performance on such tasks as reciting six numbers, handing experimenter three, four, or five dominoes and matching tasks improves with an increase in age (D'Mello and Williamson, 1969).

Children, aged three through eight, prefer form in color-form matching tasks to color or size (Harris, Schaller, and Mitler, 1970; Kagan and Lemkin, 1961). Perception and sorting of form increases with age level with most form choices for geometric figures, next for realistic figures, then scramble figures (Harris, Schaller, and Mitler, 1970). When form responders are compared with color responders in either a form or color matching task there are no differences in discrimination learning or IQ (Corah, Jones, and Miller, 1966).

The simpler the stimuli used in preliminary training of concept learning, the faster fours and fives will learn the task; and once the concept is learned under simple conditions, they readily transfer to a situation where the same concept is relevant but the stimuli are highly complex. The young child can learn concepts commonly considered beyond his capacity if the situation in which the concept is presented is sufficiently simple (Petre, 1968; Ginsberg, 1969). Ability to make a conceptual shift and ability to label correctly overt responses increases with age (Kastner, 1969; Blank and Bridger, 1964; Lipsitt and [illegible] 1963). Three-, four- and five-year-old retardates can learn a simple discrimination task and eventually learn to reverse without benefit of verbal instruction (Sidman and Stoddard, 1966). But children, not retarded, who have had comparatively more than normal experience with language were able to perform a far transposition more effectively after morphological cue treatment (Potts, 1968). At age three, 69 percent of cross-modal choices are correct; at four, 84 percent are correct; at five, 95 percent are correct. The fours and fives, but not the threes, perform better than chance. Despite success very few children can verbalize reasons for their correct answers. Some who are able to verbalize may not be able to make the cross-modal transfer. Verbalization appears to operate on three levels: 1) stimuli are labeled but labels do not facilitate discrimination; 2) stimuli are labeled aiding a modality specific discrimination bound to specific stimuli which does not transfer across modalities; 3) the stimuli are labeled and the label represents a concept which can be abstracted and applied independently by the child to an analogous situation in another modality (Blank and Bridger, 1964). Children are also more able to make reversal transfers more easily when training is on form than when on color. They also reverse more easily on their preferred attribute whether it is form or color (Trabasso, Stave, and Eichberg, 1969). Learning of fours through sevens under intentional set is superior to learning under incidental set (Amster, 1965). Children presented with several conditional space discrimination problems in one day showed marked improvement in performance from the first to the second task and then a slight decline which was attributed by the experimenter to boredom ([illegible]). Preschool children find reversal shift learning more difficult than non-reversal shift learning when no irrelevant non-spacial dimensions are present in the training trial. Reversal shift is not inherently more difficult than non-reversal shift, but the ease of reversal shift depends on the training (Fritz and Blank, 1968). Mixed prereversal training is more beneficial than positive, negative or no reversal training (Naughter, 1968). Only one experiment does not find differences due to pretraining (Coble and Price, 1966). Children who are able to make reversal shifts do better on visual decoding, motor encoding, and vocal encoding tasks than children making non-reversal shifts (Kastner, 1969). Reversal groups produce more variability than non-reversal and controls. Both control and non-reversal groups show positive transfer and reversal groups show negative transfer. There was no significant effect attributable to the instruction to verbalize (Kendler, Kendler, and Wells, 1960).

Probability learning in preschool children is positively related to recency of the interval between the stimulus and the response (Bogartz, 1965; Bogartz, 1965; Bogartz, 1967). The probability of an error is less given a correct response on the previous trial than given an error (Bogartz, 1965). The younger preschool children choose the reinforced response more often than older children (Lewis, 1966; Gratch, 1964).

When given warm-up and feedback on a same-different task in the discrimination of letter-like forms, nursery school children are no different from second graders on line to curve and rotation reversal errors; however, when given warm-up and feedback which gives inappropriate information regarding rotation and reversal but appropriate information about line to curve transformations, they tend to make more rotation and reversal errors than second graders (Hall and Caldwell, 1960). Discrimination is also learned more easily when given training in which transformations of the standards were the comparison stimuli rather than when the comparison stimuli were very different. Performance also varies as a function of the type of transformation. Left-right reversals are more difficult than up-down reversals, the 90 degree rotation and the 180 degree rotation (Williams, 1969). Children trained in an intermediate size concept and then given a one trial near, middle and far transposition task showed decreasing ability in transposition with increasing area ratio (Reese, 1965; Reese, 1961).

In a sorting task under two conditions (stimulating competition present and not present), there is a general increase in the number of children in successive age groups who tend to make matching selections on the basis of functional characteristics. The younger the child is, the more likely matching will be a stimulus simularity. When opportunities for using stimulus properties are present, they are preferentially used by young children, but when stimulus properties are absent an increase in functional and category choices occurs (Birch and Bortner, 1966).

When consistent training is provided in verbal identification of stimulus components, performance improves more than when inconsistent training is given (Hawkins, 1964). It is necessary, however, that attention be focused on the cue which is being used. Children given training on cards printed in black with color lines radiating from the words, cards with words and cards with colored lines only did not learn the task. Apparently the children did not connect the cues with the words ([illegible] and [illegible], 1967).

Regardless of previous training in classification, young children show discrepancy in responses to objects and pictures. Children who have had previous training in classification do not differ from their controls eight months later in giving single grouping responses. Children who have been trained, however, are superior to controls in being able to produce multiple responses and to use more varied criteria in classification. After receiving booster classification training, they showed an increase in grouping responses, as did children receiving classification and attention training for the first time. New training did affect analytical performance and impulse control but it did not affect performance in logical operations and conservation (Sigel, Jarman, and Hanesian, no date).

Brain damaged children are not different from normal children in their comprehension of words presented by pictograph. Normals, however, show differences in their ability to perform an enactive task, a pictograph task, a logograph task, and a synthesis task, indicating that synthesizing ability increases with age (Farnham-Diggory, 1967). The implementation of an experimental curriculum for young mentally retarded children indicates the effectiveness of teaching methods which maintain conceptual wholes while directing attention to components (Connor and

Talbot, 1966).

Creative processes.--Teacher direction affects the paintings of kindergarten, first and second grade children in ways which are not always negative. Direction to paint without guidance as to subject matter appears to be frustrating. Types of situations in which highest scores are produced vary from "directed what" at kindergarten to "free choice" at second grade. Paintings designed as "feelings paintings" do not give an adequate measure of the child's maturity according to the Easel Age Scale (Douglas, 1961). As the group size of preprimary children decreases, the total number of questions and the number of questions about discrepant events increases and the number of repeated questions decreases (Torrance, 1970). Test method does not affect generalization patterns about squares of diffuse size. Young children respond maximally to test stimuli while spontaneously labelling the size stimuli big and small (Landau, 1969).

Intelligence.--Preschool children enrolled in a variety of early childhood programs supplied the basis for a number of conclusions about their intellectual development: 1) young children collect information which they test and use in conversation and dramatic play; 2) young children employ the essential elements of concept formation; 3) young children are concerned and can deal with ideas and information about the "far away"; 4) young children attempt to understand and distinguish between real and unreal explanations for phenomena in their environment; 5) young children attempt to understand the demands of social living; 6) young children experiment with language and use humor--struggle to understand and use the various means of communication, experiment with the sound of words, experiment with the humor of reality distortion (Wann, Dorn, and Liddle, 1962).

The mental development of children during the first five years in a Swedish urban community as measured by The Terman-Merrill Intelligence Test shows developmental differences between classes (Klackenberg-Larsen and Stetson, 1968). A comparative study of Australian and Russian children revealed a similar relationship between psycholinguistic ability and the ability to regulate behavior through speech (Joynt and Cambourne, 1968). Among Lebanese children who are undernouished the median IQ was found to be 79.5 as compared to 103 for the control group, and these children walked and talked approximately two months later. Both sets of scores were normal on the Gesell Developmental Scale. On the S-B both performance and verbal scores were lower than the control group (Botha-Antoun, Babayan, and Harfouche, 1968).

Mental age of non-institutionalized mongoloids is correlated positively with all Primary Mental Abilities subtests and totals. In children of nine years having MA's of at least three years, higher and lower levels of functioning can be identified. There is no decrease in the degree to which Primary Mental Abilities are interrelated with increasing age (Junkala, 1966).

Language.--In the growth of control of grammar between two and six, imitation is more advanced than comprehension, and comprehension is more advanced than production. Since comprehension scores are higher than production scores, the child learns much about the rules that relate to referential patterning before he can produce the forms (Lovell and Dixon, 1967). The predictability of children's language between four years three months and five years six months depends on the type of phrase and the level of syntax. The role an adult plays in relation to children does not affect his predicting ability. As usually uttered, children's language yields less than 50 percent redundancy (Dreher, 1968). An increase in age is positively related to an increase in recall scores for both four and six word sequences and at test and retest. Immediate memory decreases with reorderings of a simple declarative sentence in such a way that best recall is found for the intact declarative sentence, next for the subject and predicate reversal, next for the reversal of verb and object, next for the reversal of nouns and their modifiers, and poorest for the complete sentence reversal. The order in which the modification of syntactical sturcture reduces recall remains constant throughout the preschool years (Salzinger, Salzinger, and Hobsen, 1966). There is an increase with age in the length of word strings which three through five year olds can repeat. Addition and replacement errors are fairly common, with the words which are added or used as replacements taken from previous word strings. Children's deletion errors are highly correlated to the form class of words. Percentages of deletions were as follows: *the*, 36.6 percent; verbs, 7.27 percent; nouns, 11.7 percent; *your*, 30.6 percent; *by*, 13.77 percent; *is*, 20.5 percent. Imitation errors of children were largely accounted for by deletions. Function words are deleted more often than content words (Scholes, 1969).

Brain damaged preschool children are inferior to normal children in most nonpersonality measures. The Vocabulary Scale is one of the most discriminating measures between normal and brain-injured, but the greatest diagnostic problem is usually presented by children who are normal in language skills. For such a child measures such as the Block Sort Test, Copy-Forms Test, and Perceptual Motor Battery have considerable discriminating power. Compared to normal children, impairment is marked in cognitive and perceptual motor areas and relatively slight in the areas of personality functioning (Ernhart and Others, 1963). Cleft-palate children show retardation in both language comprehension and usage. Although their language scores become progressively higher at each six month age interval between eighteen and seventy-two months, their scores are lower than the appropriate CA (Philips, 1969; Smith and McWilliams, 1968). All age levels show consistent and substantial weakness in vocal and gestural expression and visual memory relative to their performance in other areas of psycholinguistic functioning (Smith and McWilliams, 1968).

Mediational processes.--Paired associate learning of preschool children is inferior in the condition of high stimulus similarity and improves in the medium and low similarity condition (Price and Saravo, 1968). In a paired associate task using line drawings and three kinds of instruction, the imagery instruction group took less number of trials to criterion; next in effectiveness was verbal context, followed by new control and replicated control groups. Only the imagery group was faster than the control groups. With verbal context there was no difference (Reese, 1970). In a comparison of the influence of training and test ratios on transposition, first test trial results showed more transposition for children trained with larger ratios, but no distance effect. Overall test performance showed some evidence of a distance effect. Increases also occur across test trials (Osen and Cole, 1967). The effect of larger ratios in improving transformation is also seen in a transformation problem involving the verbalized relationship of large and small (Zeiler, 1966).

Preschool children stopped playing with a desired toy in the face of either a mild or severe threat of punishment. A mild threat of punishment led to devaluation of the toy which was greater than that with severe threat (Aronson and Carlsmith, 1963). Verbal conditioning leads to an increase in food consumed on the first day. Such reinforcement, however, becomes increasingly ineffective with satiation of the reinforcing stimuli and for the foodstuff that was manipulated (Lovaas, 1964).

Memory.--There is no primary effect among fours and fives, whereas primary effect is found among primary children in a short memory task (Donaldson and Strang, 1969). It has also been found that a two-second interval in a paired associate task results in more omissions than a six-second interval. The short interval group also omitted more responses than the long interval group (Price, 1963). The dependency relationship can be used to facilitate intentional and incidental learning in memory tasks from audiovisual presentations in young mentally retarded children. Children who attach high reward value to the film model reproduced her responses more often than did children who had had no prior experience with her. Presentation by the teacher is more effective, but retarded children can learn from audiovisual materials prepared especially for them (Ross, 1968).

Perceptual processes.--Threes, fours, and fives are better able to recognize right side up figures. Performance is not affected by age or orientation of the array (Ghent and Bernstein, 1961). For the visual recognition of incomplete objects by threes, fours and fives, the greatest completeness of representation is required for the youngest children. Training decreases the amount of representation required for recognition. Greater developmental differences are found when training with complete pictures is provided (Gollin, 1960). Preprimary children differ from primary children in their perception of figure inversion. Preprimary children do not have a preferential orientation for non-realistic figures.

For primary children the preference is for upside down figures (Dodd and Strang, 1966). Iranian children show a strong preference for vertical orientation of figures (Antonovsky and Ghent, 1964). Preschoolers make more color responses and more part responses than third graders (Corah and Gospodinoff, 1966).

Gains on haptic performance for threes, fours and fives enrolled in a Montessori program exceeded those of non-Montessori children (Concannon, 1966). However, training on haptic tasks among children attending Montessori and non-Montessori preschool programs resulted in higher change scores for controls than for the experimental group in both types of programs. The only change among experimental children on haptic learning from Montessori or non-Montessori was in favor of the non-Montessori group on scores attained at the twelve month interval. Within the experimental group it made no difference whether the children attended morning or afternoon sessions (Coyle and Concannon, 1968).

Children between ages three and one-half and five and one-half who have been trained with ITA show greater improvement in articulation than controls when tested on the Goldman-Fristoe Filmstrip Articulation Test (Goldman, 1968). Black and white photos of younger unfamiliar children are easier for children in kindergarten, third, and eighth grade to discriminate than older or middle children's pictures. Older boys and girls recognize more pictures than younger children (Goldstein and Chance, 1964). Prior training in one sense modality (auditory discrimination) does not effect learning set formation in a second sense modality (visual discrimination) in four to six year olds. Differences between sub-normal children below an MA of five and normal children of similar MA's in the formation of discrimination learning sets are ambiguous.

Neither the failure to learn visual discrimination nor the failure to form elementary learning sets can account for their intellectual retardation (Lunzer and Hulme, 1967).

When preschool children are exposed to a novel play situation (novel climbing apparatus), they take longer to approach the object of novelty on initial exposure than they take upon subsequent exposure a day later (Jeanrenaud and Linford, 1969). The onset or termination of a dim light as reinforcement exercises a strong reinforcing effect on the lever pressing behavior of three and one-half to five and one-half year olds, but the effect diminishes on successive days. When pictures were added, the results suggested that the onset of the light was more reinforcing than the termination of the light (Antonitis and Barnes, 1961).

The behavior of kindergarten and first grade children in using the Edison Responsive Laboratory goes through five phases. The first is free exploration and no statement can be made about achievement. In the second phase the child has learned that the typewriter only works when he strikes one key at a time, has discovered the purpose of the return key and is able to find some of the letters when shown an example. In the third phase the child has learned to discriminate capital letters and small letters. Phases four and five involve typing words and stories and using the booth for related classroom activities. Forty-five percent of the first graders and 13 percent of the kindergarteners reached phase five. Booth achievement is related to the amount of time a child spends in the booth (Nimnicht, Rayder, and Johnson, 1969).

In a programmed instruction approach to beginning reading, the oral response group made higher mean scores than the non-oral response group. Oral responding appeared to facilitate the recognition and comprehension of printed words (McNeil and Keislar, 1963).

General cognitive.--Longitudinal study of conservation tasks confirms Piaget's order of difficulty of the tasks and highlights the transitional nature of the age period from five through seven. Correlations between progress in conservation and other measures of mental aptitude and school achievement are only moderately high (Almy, Chittenden, and Miller, 1966). Four training procedures (cognitive conflict, verbal rule instruction, language acquisition and multiple classification) were used with four to six year olds to investigate their effect on improving conservation. No differences were found between the experimental groups and the control for each training method; however, with the passage of time there was an increase in conservation of number which led to the conclusion that conservation of substance was not induced by a variety of techniques (Mermelstein and Meyer, 1969). In a similar experiment in which one-third of the children received direct training in number conservation, one-third received training designed to produce internal conflict, and one-third received no training, a greater number of conservation responses were made in the conflict group than in the control group. In length conservation the conflict plus verbal pretraining group did better than the control group without verbal training. In substance conservation, the conflict group without verbal pretraining did better than the control group. There was little transfer from number conservation to length and substance conservation (Gruen, 1965). Instruction has also been shown to induce conservation of number, weight, volume and mass in three through five year olds which showed no extinction after three weeks. Differences were found between CA levels. MA levels consistently correlated more closely with conservation than CA levels. Correlation among the major types of conservation (numbers, mass, weight, area, volume, and reversibility in mass, weight and number) were about the same as those within conservation of number (Young, 1969).

In the conservation of length there is a difference associated with age which seems to occur between the ages of four and five when data are considered collectively. Differences also occur with regard to the amount of verbal exchange between the experimenter and the child and the comparative length of rods used in the various tasks (George, 1970). Conservation of length is not unitary in nature relative to the reflexive and non-reflexive properties. There appears to be little, if any, relation between verbal maturity, IQ, age and social class and scores earned by four and five year olds on conservation of length items involving the reflexive or non-reflexive property (Carey and Steffe, 1969). The ability to conserve length is not a necessary nor a sufficient condition for the ability of transitivity of length relations. Conservation of length relations involves properties and consequences which may be necessary for transitivity (Carey and Steffe, 1969). A factor which may be related to the effect of instruction on understanding seriation is the child's stage of development when the instruction is given. Children three and one-half to seven and one-half who were in the transitional stage in understanding seriation made gains after given instruction (Coxford, 1964). Between the ages of four and nine there is a regular increase with age in the percentage of children who perceive both parts and wholes. Parts are perceived at earlier ages than wholes. Children of average and above average intelligence perceive parts more easily than they perceive wholes. A majority of nine-year-old children are able to make part-whole integration (Elkind, Koegler, and Go, 1964).

In a test of Piagetian theory using a multiple-choice picture story projective test, children in kindergarten and first grade showed random preferences (L'Abate, 1962).

Acquisition of the concept of probability is a developmental phenomenon which increases with age with almost all children learning the non-verbal task at age six. At age five about one-third can verbalize the probability concept but at age three years eleven months none can pass either the verbal or non-verbal test. The non-verbal test is passed by 75 percent between CA three and six. A much smaller percentage can pass the verbal test (Davies, 1965). Probability judgments of fours and fives are highly dependent on task conditions. Judgment may be influenced by color preference and the proportion in which two stimuli are mixed. For children who use probability rules, judgment becomes more difficult when probability approaches .50 (Goldberg, 1966). Fours and fives demonstrate a greater understanding of probability under one condition (decision making) than under another (project task), casting doubt on Piaget's contention that young children cannot understand the probability concept (Yost, Siegel, and Andrews, 1962).

The youngest level for the solution of oddity problems falls between three and six years; for conditioned oddity problems, no younger than six years; and for object discrimination the initial level varies with age with older children being more discriminatory, but not in the final level (Hill, 1962). Retarded children have less skill in logical thinking than normal children. Participation in a creative multi-media program results in higher posttest scores on logical thinking, indicating that the training program was appropriate for the abilities of the children (Ross, 1969). In subnormal children between one and nine years examined on various aspects of development according to Piaget's sensori-motor stages, locomotor development was more advanced than speech development (Woodward and Stern, 1963).

Summary of findings in cognitive domain

Many of the limitations mentioned in the summary of the psychomotor domain are equally true for the cognitive domain, i.e, most studies do not make comparisons between ADV and DADV, studies at one SES level have not been repeated with other SES levels, and studies with Anglo children have not been replicated with Negro children. Many studies do focus on specific age levels, but most studies do not state findings in terms of ethnic groups. There is a notable lack of data in several areas of major interest. For instance, there are only five studies of ADV Negro five year olds; only three of ADV Anglo children, mixed ages; only six of DADV Anglo under five years of age; only one of Anglo DADV children, mixed ages; only four of Negro children of undesignated or mixed socioeconomic background, under five years of age; only three studies of Negro children of undesignated or mixed socioeconomic background, mixed ages, and there are no studies of ADV Negro children, mixed ages.

Socioeconomic differences.--Compared to ADV children, DADV children appear to be more impulsive in response disposition. ADV under fives prefer complex figures and novel stimuli while Head Start children do not have this preference. The attention level of ADV children is higher than that of DADV children for watching television program segments.

Much of the data on readiness is not comparative, but some differences can be cited. In follow-up studies in later school years, ADV children receive higher grades and test scores generally than do DADV children.

This difference is also evident on the reading readiness tests generally given at the end of kindergarten and on tests such as the Peabody Picture Vocabulary Test (PPVT), Metropolitan Reading Readiness Test (MRRT), and Gates Primary Reading Test (GPRT). The ADV child usually has had more pre-reading experiences that are related to first grade achievement than has the DADV child. Early readers are usually from HSES levels. The urban DADV child displays different cognitive defects than the small city or rural DADV child, who in some respects is more similar to the MSES population. DADV children seem to profit more from visual discrimination pretraining. Often the gains shown at the end of a preschool program for DADV children disappear after entry into the primary school. Abilities of DADV children after preschool programs range from groups that compare favorably with or equal to suburban ADV children to groups that show no gains.

DADV children differ from ADV nursery school children in the area of number concepts and ordination. The DADV children appear hindered in discrimination and labeling processes required for classification. MSES children taught sorting tasks by their mothers perform well above LSES children, particularly in offering verbal explanations as to the basis for making their sorts. MSES children show more reflection and evaluation of alternatives and more objective and abstract thinking than LSES children. Compared to LSES children, HSES children make more use of the presence of adults in their problem solving. MSES children make more correct choices than LSES children on picture-object matching and on arranging pictures spatially. HSES children learn discrimination tasks faster, make more correct responses and show a preference for the higher possibility alternative than LSES children. ADV score higher than DADV on the Children's Embedded Figure Test (CEFT) and the Matching Familiar Figures Test (MFFT) except for subtests on number of contacts and number of manipulations. Compared to HSES children, LSES children's problem solving behaviors are more poorly developed. LSES children do improve in discrimination performance to a greater extent than HSES children, but it is a result of familiarization with the test. DADV non-English speaking children are consistently below the population mean for each concept category.

Most ADV and DADV children use miniature replicas as "props," but DADV do not use undefined play objects or substitute verbal description for objects. ADV verbalization serves three functions: imitation of adults, imaginative make-believe, and management of play. Verbalization for DADV serves the function of play only and is not imaginative or make-believe. ADV are "concept-and-word minded," while DADV children are "act-and-word minded." In ADV children the leader is difficult to spot and leads by virtue of his capacity to sustain projection of encompassing theme and ability to explain satisfactorily the logic of his opinions and actions; the function and behavior of the leader is one in which the DADV child takes on the role of authority. ADV children laugh with one another in the handling of problems or tensions while DADV laugh at each other. ADV children's criticisms are not directly personal but DADV children's are. ADV are a little overt in their aggressiveness and DADV are openly aggressive. ADV plan their play verbally and identify with a role while DADV spontaneous play takes place only within the classroom and in corners equipped for play. A complex imaginative theme can be discerned in ADV's sociodramatic play, and these children are flexible in their use of props and setting. Most MSES children have dramatized stories at home but few LSES children have. Their mean originality scores are higher than LSES children's scores. ADV children's representational play is somewhat more elaborated and differentiated than DADV children's. ADV engage in more verbal descriptions. There is some difference in scores of creativity in the use of painting materials between ADV and DADV children.

ADV children give higher predictions of scores they will attain than DADV children. There is a wider range of IQ points in DADV groups than in ADV groups. ADV children do not have to be taught many of the subskills taught DADV children in comparable programs. The average scores of MSES children on both verbal and non-verbal tests are almost identical. Where there are comparable data, DADV children have lower IQ scores on all of the tests used than do ADV children.

Anglo MSES children use proportionately more complex sentence types in free speech situations than Negro LSES. They also demonstrate more control of the 13 common syntactical structures. ADV nursery school children make more responses than Head Start children (both fours and fives) in comparative studies. MSES Negro children differ from LSES Negro children in total vocabulary with the most difference in the use of noun and verb clauses. The MSES group utters longer and more complex sentences with relatively fewer nouns than the LSES group.

ADV Negroes produce a great many more words to describe pictures than do ADV Anglos and DADV Negroes. DADV children ask fewer classroom questions and are rated lower than ADV children on oral expression by their teachers. MSES children without preschool score as well as LSES children with preschool.

In recall of lexemes over that of words, MSES children are near maximum level at the beginning of training. Consequently, LSES children show more improvement than MSES children. As string length increases for more complex language forms, Head Start fives' performance drops below that of MSES fours. A DADV group's mean error to criterion on paired associate learning tasks is more than the mean error of ADV children.

In the area of mediational processes, maternal teaching behaviors are as useful or more so than mother's IQ or social class as predictors of her child's behavior.

On spatial arrangement MSES children receive higher total scores than LSES children. The occurrence of representational activity as an inclusive or dominant mode of approaching the task situation is more prevalent among MSES than LSES children. ADV show high auditory decoding and auditory-vocal skills.

Several comparative studies indicate no differences between SES groups on conservation tasks. Others indicate that ADV children make more consistent nonconserving responses than DADV children at age four and more conservation responses at age five. Perceptual supports are more effective for DADV children ages six to six and one-half and sensorimotor supports are more effective for younger fives. DADV children's conserving responses increase with age.

Age differences.--Threes are limited in the number of words they can learn to read, while fives give evidence of more ability for handling prereading experiences, including some formal reading activities. There is a steady development in sounding out words, recognizing letter symbols, and reading. By five, self-correction of errors begins to become apparent. There is a consistent increase in ability to count as a function of CA. Kindergarteners also show a substantial gain in understanding numbers.

A definite difference is observed between children older and younger than 67 months in repeating number problems, copying and recognizing Arabic numerals, and in the intelligibility rating on numbers and number problems. Older fives achieve higher scores on readiness tests.

There is a definite age trend for children's responses to commands varying in complexity. More children four and one-half and older order pictures correctly. Age discrimination of photographs reaches a ceiling at age five. Color and size discrimination is easier for threes than for sixes. Few threes and fours attain criterion on conditional discrimination tasks. Under fives respond by color or form and not by both, although this can be fostered through training. They make fewer correct responses in oddity problem learning than kindergarteners. The over-all errors on tasks requiring matching letter-like forms correctly decreases with age while the ability to make a conceptual shift and ability to correctly label overt responses increase with age. Ages five and six appear to be critical in acquisition and transfer, respectively. Kindergarteners older than 68 months are higher in achievement on money, number, measurement and total scores. There is a progressive change from nursery school to third grade in the use of color concepts in the construction of forms. The total number of errors on concept utilization tasks decreases with age. Fours have great difficulty recognizing a double alternation sequence. Varying stimuli and irrelevant dimension or attribute are more distracting for fours and younger. After four the number of correct responses increases. Fives demonstrate perception of one-to-one correspondence in their matching and can perform simple addition and subtraction of concrete instances. Fives and older handle oddity problems better than fours. The percentage of correct cross-modal choices increases from age three to five. The younger child chooses the reinforced response more often than older children. Children of a variety of backgrounds who speak a foreign language at home show a progressive increase in their accomplishments by both CA and MA grouping.

Threes to fives show a steady decrease in errors in discerning the roundness, pointedness or squareness of an object. Generally, older children play better than younger children. Children who entered a program at ages four and five show a continuity of creative growth over three years.

Prekindergarten treatment does not lessen the gap in IQ between DADV and ADV but prevents the difference at age four from increasing by age five. Among DADV threes through sixes, threes and fours show the most dramatic IQ gain in programs. Children who enter programs at age five make the expected gain for children entering at age four.

Children in each succeeding age group emit more information processing predicates to other children. DADV fours rate lower than fives on intelligibility rating on words and sentences and relating a story via pictures. There is an increasing use of transformations as age increases. Decreasing numbers of older children use restricted transformations. While adverbs denoting position or direction in space (up and down) are understood by age three, adjectives denoting spatial relationships (left and right), number or relative quantity generally are not understood until age five and one-half or six. Plural/singular contrasts marked by collection of nouns are comprehended by five; simple imperative sentences by three; neither/nor as negatives not until seven; and passive voice by age five and one-half. More kindergarteners than nursery school children learn grammatical sets, but threes and fours can recall a nonsense string of phonemes better than fives. The percentage of use definitions tends to decrease with age. Five and one-halfs to six and one-halfs hold a conversation more frequently than younger children. Dramatic play use of suggestion and agreement increases with age. Children under five give no indication that they can differentiate between "more" and "less," and fours fail to verbalize scorable reasons for conservation tasks.

Developmental trends are obvious in shape recognition. Important cues for younger children are those which afford information about the texture of objects rather than their shapes. An increase in age is positively related to recall scores. Fours cannot maintain sequences without perceptual support but most fives and sixes can. Fours tend to use concept reorganization or clustering more than serial order recall. Serial ordering appears during the fourth year.

After four and one-half, inter-problem transfer begins. Performance on oddity discrimination problems indicates reliance on negative cues for younger children and stronger positive tendencies for older children. Between four and one-half and five and one-half verbal mediation facilitates transposition of the middle size response. The ability of more complex language to regulate the child's behavior begins around age four and is achieved by most children by age six.

By ages five and six there is an increase in the accuracy of sameness-difference judgments. Scores on perceptual tasks requiring object naming increase with age. There is a rapid linear increase from three to five in visual recognition of a cue that is moved through several spatial transformations before the judgment is made. Figure-ground discrimination improves between ages three and five. Threes do not transfer from the visual to the auditory mode, but fours and fives do. The focal part of a figure is perceived by threes and the top part by fives. The perceptual recognition of pictures of familiar objects in varying degrees of focus increases between four and five and one-half years. Five and one-halfs, compared with fours, show an increase in their spontaneous pre-cognition verbalizations in mention of details and attributes. For visual recognition of incomplete objects, the greatest completeness of representation is required for the youngest children.

Fours give more inconsistent nonconserving responses than fives, but fives are not consistent either. Between four through seven, the percentage of children who can show transitivity of length increases. Fours through sixes perform better on perception tasks than on prediction. They can match objects, collect small groups which share common factors understand some or all relationships and form exhaustive classes. The sophistication of their responses in problem solving behavior increases. Perceptual explanations show a decrease at the end of this age span, while symbolic explanations show an increase. In relation to Piaget's conservation theory, most studies show some conservers at each age level with some increase in the number of conservers at each age level. Evidence is given for the success of kindergarten and other training programs in inducing conservation, although figures indicate that the children who conserve were in a transitory stage at the beginning of the program.

Ethnic differences.--LSES Mexican-American children have a lower attention level on all segments of television programming. There is a difference between Negro and Anglo children using seriation scores as a criterion. Scores on the Metropolitan Reading Readiness Test are also different for Negroes and Anglos. Non-Puerto Rican white children are ranked higher by their teachers than Negro and Puerto Rican children. Mexican-American children show less progress than Anglos on reading and arithmetic in Head Start programs where they are compared. DADV Negro children are less often interested in only one or two objects or activities than the DADV Anglo child but are more skillful at tasks requiring physical coordination. The Negro children have lower esteem, less preschool education, less preference for father and fewer fathers present at home than Anglos. The Edison Responsive Environment minimizes differences between Negroes and Anglos.

Anglo kindergarteners make greater absolute gains in number concepts than Negro kindergarteners but lesser relative gains when both groups are compared to their respective controls.

Low IQ Anglo and high IQ Negro children score higher on divergent thinking measures than high IQ Anglos and low IQ Negroes. Anglos are less fluent on an "unusual uses" test than Negroes.

In programs where comparisons are made, Anglos out-perform Negroes on verbal and full-scale measures of the Wechsler Intelligence Scales for Children (WISC) and on the Peabody Picture Vocabulary Test (PPVT). DADV Negro children score higher than Mexican-American children, as do Anglos, with the greatest difference occuring at age five. DADV Mexican-American fives score lower on the PPVT than MSES twos and threes. Likewise, DADV Mexican-American children show greater gains in intervention programs than Negro and Anglo children.

Anglo MSES children in free speech situations use proportionately more complex sentence types than Negro LSES children and exhibit greater control of 13 common syntactical structures. Negro children have a highly structured language patterned after that of adults in their community which differs from the language of Anglo children. Many of the Negro speech patterns exist in the form of fragmenting expressive phrases or simple sentences. Most expressive patterns show an omission of verbs and infinitives which is generally common to the dialect of the children.

Puerto Rican mother-child pairs are twice as active as Negro mother-child pairs in verbal and non-verbal forms of communication that encourage exploratory behavior and learning. The Negro mother is more active in the use of verbal admonitions and in directing and coercing verbal and non-verbal communication. DADV Mexican-American children produce considerably fewer words to describe pictures than Negro and Anglo children. Indian children score particularly low on verbal measures. Negroes and Mexican-Americans score lower on tests of verbal proficiency than Anglos. ADV Negroes produce a great many more words to describe pictures than ADV Anglos and DADV Negroes. Kindergarten attendance has substantial effects on the verbal comprehension of Negroes but only slight effects for Anglos.

In paired associate learning tasks using photographs as stimuli, Negro children perform below Anglos. In sensory perception Negro children are superior to Anglos and Orientals.

Very few comparisons exist for ethnic groups on conservation tasks. MSES Anglos show more conservation responses in a control condition than LSES Negroes. On object sorting tasks Indian children's scores are similar to those of DADV Negroes. Both Anglo and Mexican American fours increase their judgments of equivalence.

Affective Domain

Advantaged Anglo children under five years of age

Social behaviors.--(Aggression). Aggressive behavior declines among four-and-one-half-year-old boys from a natural base rate of about 13.4 percent of their initial interactions in nursery school to about 7.4 percent half way through the first term. The comparable figures for girls are relatively stable, dropping from 3.5 to 3.1 percent. More mature "adult-like" behavior increases in the same children from 13.5 to 18.5 percent for boys plus girls, with girls showing higher base and terminal rates (Vetz, 1960-61). Aggression has been found to be positively related to empathy in boys of this age but unrelated for girls, whereas among older preschool boys, the relationship becomes negative but remains zero order for girls (Feshbach and Feshbach, 1969). This suggests that aggressive behaviors among preschool boys may signal approach or prosocial contact making, whereas it may more indicate antisocial tendencies or social immaturity later.

(Dominance). Absolute levels of dominance, submission and resistance to domination are not extremely stable across play sessions of child dyads, but the relative positions maintained by fours show modestly high consistency for dominance and submission and low consistency for resistance (Gellert, 1961). Using relative position in the rankings as a criterion, around 70 percent successful prediction can be made of which members of as yet unformed pairs will emerge as dominant, when these have not been extremely different in initial ranking (Gellert, 1962). Unqualified power assertion (UPA) by mothers is correlated with nursery schoolers' observed hostility to peers (.60), power assertion toward peers (.48), resistance to peer attempts to influence them (.68), resistance to teacher influence attempts (.42) and being more hostile and more resistant toward peers than toward the teacher (.51). Apparently father UPA does not affect the child's status directly, but father authoritarianism seemingly affects his power assertion toward the mother, thereby contributing to her power assertion toward the child. Middle class fathers and mothers are lower on the respective characteristics that affect these qualities in offspring than are working class parents (Hoffman, 1960).

(Situational factors). Attempts to identify situational and family factors which maintain this particular group's interpersonal behavior have been plagued with methodological problems and inconclusive findings (Robbins, 1963; Reichenberg-Hackett, 1962).

(Imitative behavior). In a discrimination learning situation, fours' imitative behavior is facilitated by a brief prior history of warm, rewarding interaction with the adult model, although aggressive behavior is readily imitated irrespective of prior relationship established (Bandura and Huston, 1961).

(Resistance to temptation). Among fours, more active boys and less emotionally reactive girls are more resistant to temptation (Burton, Maccoby, and Allinsmith, 1961). Conformity as a means of resistance to temptation is facilitated by a motive to please the opposite-sex adult (Burton, Allinsmith, and Others, 1966).

(Dependency). Dependency arousal by withdrawal of attention increases boys' identification with and conformity to an adult's standards in a game, but decreases conformity if rejection is felt. For fours of both sexes withdrawal of attention increases conformity motivation if the child has the motive to please the opposite-sex adult (Burton and Others, 1966). As will be seen later, many fours do manifest this motive. Unlike imitation of aggression, a cross-sex orientation rather than a same-sex orientation of child to adult seems important. These data plus those subsequently reported regarding aggression suggest that peer contact behaviors among preschoolers may be encouraged by the same-sex adult and that conformity to rules made by adults may be encouraged by opposite-sex adults.

Children rated by teachers as higher in dependency are less accident prone at three and four years (Bitner and DeLessovoy, 1964). This is apparently due to the lower tendency of dependent children to test the limits of their environment, thus operating for them as a safety factor.

(Sex-typing). More masculine boys see their fathers as more nurturant, rewarding and powerful (Mussen and Distler, 1959). Self-consciousness regarding sex-appropriate toy choices is not apparent in boys of three and four years of age when an adult is present. Boys and girls of this age play less with sex-typed toys than do older children, irrespective of adult presence (Hartup, Moore, and Sager, 1963).

(Prosocial behaviors). When cooperative versus competitive achievement behaviors are rewarded among fours in a situation where cooperation maximizes payoff, rewards for cooperation result in vastly more rapid completion of problems. Children are highly sensitive to reward cues for cooperation and competition, but are relatively insensitive to the need for mutual assistance and the possibility of sharing turns when the situation invites competition (Nelson and Madsen, 1969). Negro and Anglo and MSES and LLSES appear to behave in a quite similar fashion in the foregoing. However, naturalistic studies of sharing, under no constraints, show vastly higher rates for MSES Anglo than for LSES Negro four and one-halfs, and among initial non-sharers MSES are more readily induced by social reinforcement to share (Doland and Adelberg, 1967). Social class and ethnicity are unfortunately confounded in this study. Among boys of four and one-half years, altruism, generosity, cooperation and sympathy are all positively associated with father nurturance and negatively associated with child competitiveness (Rutherford and Mussen, 1968).

Social perceptions and communications.--(Status awareness). Negative and positive connotations (color meaning) are given significantly often by threes to the colors black and white, respectively. This tendency increases further among fours and even further among fives. Awareness of Negro and Anglo racial identification and labelling increases linearly with age also, but at a slower rate than does color meaning (Renninger and Williams, 1966). Racial awareness thus appears to be quite low in under-fives (Abel and Sahinkaya, 1962). Regional differences are also evident, with southern Anglo nursery school children showing higher racial awareness than southern Negroes or northern Anglos or Negroes (Morland, 1966). Nursery school children display color meaning and generalize this to associations with race (Stabler and Others, 1969).
At a more general level, social perceptions show greater stability among fours than threes (Estvan, 1966). In an interracial nursery school of threes, all show racial awareness (Stevenson and Stevenson, 1960).

(Person preference). There is no general difference in the behavior of threes in an integrated nursery school, either in the type of behavior shown or time spent in same-race versus other-race interaction, although sex segregation is a consistent feature of threes' interactions (Stevenson and Stevenson, 1960). Under less ideal conditions, comparisons have been made of preferential behaviors of nursery schoolers subdivided into southern white (SW), southern Negro (SN), northern white (NW) and northern Negro (NN). SW are lower than SN in acceptance of Negroes and lower in their acceptance of Negroes than of whites when these are viewed in pictorial material. A majority of all four groups show a preference for white, with SN being least likely and SW most likely to prefer members of their own race. Whites are more likely to say they look like a white child than Negroes are to say they look like a Negro child. More than three-fourths of the white children say they would rather be white than Negro, but only one-half of the Negroes would rather be one of the Negro children in the pictures. Perceptions of mothers are subject even moreso to the same biasing effect (Morland, 1966). This study was done, it should be noted, prior to the current emphasis on pride in "blackness." Using a similar picture-story technique, it is demonstrated that fours who receive verbal praise for giving a positive verbal response about the "dark" children show a change toward attribution of positive characteristics (Thompson, 1967).

(Emotional communication). Trainable mentally retarded children of MA three years two months to four years five months viewing standardized photographs of facial expressions show high accuracy for "happy," next for "angry," next for "sad," but inaccuracy when the expression is "afraid." This pattern of accuracy closely matches that of higher MA children of average IQ, although lower MA children show lower accuracy (Dil, 1969). When threes and fours are presented a similar task in a cartoon story sequence, few children are able to use the story sequence to improve their accuracy of emotional recognition over their performance for isolated frames alone, although fives are able to show this capacity.

In their spontaneous verbalizations about cartoons, threes and fours show a rich language for describing emotion. However, following the asking of structured questions about the same faces, they tend to drop their spontaneous verbalizations and begin to adopt the same labels which appear in the examiner's questions, showing how readily one overrides the rich, natural response system. Yet threes and fours show less of this tendency than do fives and sixes (Gotts, 1971b).

Motivation.--(Failure/success). Reactions to failure on a difficult task are shown by fours by an increase in facial expressions and rationalizing behaviors and among threes more often by their seeking help or making no attempt at solution. Destructive behavior and motor manifestations are of low frequency, while expressive distress communications and information seeking are most frequent (Zunich, 1964).

(Reward schedules). Among older fours both high and low persistent children persist longer under medium reward than under high or low reward (Nakamura and Lowenkron, 1964). ADV nursery schoolers do not persist as long as DADV of similar age. ADV Anglos remain more consistently on task across a variety of different rewards (Stern, 1966).

(Preference). A "Group Test of Color/Form Preferential Behavior" shows high stability among under fives for color preference, but scores are subject to a number of specifiable minimal influence effects (Gotts, 1968a). These preferences have been successfully modified by a single session of reinforcement in fours (Gotts and Teach, 1969). The absence of the color dimension from some items as a possible basis of conceptual conflict has been demonstrated among older children (Miller, 1970), but not for younger fours (Thompson, 1970). MSES children regularly shift from color to form preference in the latter portion of the preschool years, with some children undergoing the shift at age four and others later. A developmental shift of selective attention appears to be responsible for the observed changes, and it is speeded by relevant experience, including emphasis and reinforcement for form attending (Gotts, 1971a), and generally not impeded by lack of ability.

(Peer effects). When fours teach threes to assemble wooden puzzles, MSES Anglos give more positive reinforcing comments than MSES Negroes or LSES of either race. Both sexes reflect these race and class differences. Negative reinforcement shows less variation and is used less by MSES. The frequency of reinforcement delivery is, surprisingly, not dependent upon the younger children's performance (Feshbach and Devor, 1969).

Intra-psychic factors.--(Creativity). Older fours of upper MSES background were classified as high or low creative under the typical barren testing room conditions. Creative children retested in a cue-rich room containing many objects gave signs of even greater creativity, whereas low creatives showed no environmental effect. Creative children apparently actively scan their environment for task-relevant information. That several months intervened between the two testings also shows some stability of the characteristic (Ward, W. C., 1969).

(Adaptability to demands). MSES threes respond to cognitive task demands with a greater proportion of work responses than do LSES Puerto Ricans, with the difference pronounced for verbal demands but not for performance cognitive demands. They also make many spontaneous verbal extensions of their work. If they do not work on a problem, they quite frequently excuse themselves by referring to a lack of competency for such "difficult" problems. Sex differences are absent (Hertzig and Others, 1968).

Advantaged Negro children under five years of age

Social perceptions and communications.--(*Perceptions of school*). MSES and ULSES mothers generally manifest a more positive and optimistic outlook on school for their children than do LLSES. They also see the teacher and parent more as collaborators. MSES and ULSES mothers tend to see the school as less distant and formidable and to see the issue of schooling as one of interaction, inquiry and exploration (Shipman, 1966).

(*Person preference*). MSES Negroes in both North and South prefer Anglo to Negro children in pictures. Southern Negroes of nursery school age are least likely to prefer members of their own race. Only one-half of the Negro children wish to be a Negro child in the pictures. Only 30 percent of southern Negroes identify Negro women in the photos as being what their mothers resembled (Morland, 1966).

Motivation.--(*Schedules of reward*). Older HSES fours learn faster and make more correct responses on discrimination learning than LSES. Children rewarded by "right" perform more poorly, but less so if HSES. Candy reward subjects are inferior to subjects given punishment or a reward-punishment combination (Spence and Dunton, 1967).

(*Higher needs*). Level of aspiration was studied during mother-child interaction on a cooperative problem solving task. MSES mothers predict higher success for their child on the task than do LLSES but not higher than ULSES. Upper LSES are higher than LLSES; MSES performance actually is the highest, with the others not differing. It appears that mother-child relationships, particularly the kind and extent of control exercised over the child, are more important in determining the scores than are the strictly cognitive maternal variables. Predictions of mothers, however, do not conform to the usual level of aspiration curve (Brophy and Others, 1965). This is probably due to the fact that these predictions were taken in the mother-child session rather than in a larger group.

Advantaged children under five years of age with unidentified or mixed ethnic background

Social behavior.--(*Aggression*). Among nursery schoolers aggressive behaviors increase during the first eight weeks but by year's end have returned to initial level. Peer reinforced aggression is repeated as the same response on the same victim, while negative reinforcement leads to change of aggressive response, victim or both. Children with initially low rates are conditioned by peers to show dramatic acceleration. Acceleration rate is a function of the frequency with which a child is victimized by peers. Given frequent victimization and a series of successful counterattacks, the passive child shows marked increase in assertive behavior. The active child appears to be an individual who is conditioned to be highly responsive to peer-dispensed reinforcers (Patterson, Littman, and Bricker, 1967). Boys exhibit more antisocial aggression than do girls in the nursery school setting, with interpersonal aggression and injury to objects most common in boys and verbal and telling most common in girls. Interpersonal aggression increases with age, as does tattling, in boys. An aggression syndrome is evident in boys: direct interpersonal aggression in class, toward the mother during interaction, and toward impersonal objects, but with apparent inhibition of aggression toward the father. There is a similar but less marked syndrome in girls, with tattling replacing object attacks. Of four types of frustration, only current pressures and restrictions in the home appear to relate to aggression and then for girls only. Parental punishment of aggression increases it at home and parental permissiveness toward aggression results in its increase at class (Sears, Rau, and Alpert, 1965).

Children followed longitudinally from their third year to fifth year with Beller's scales for social behaviors manifest aggression-dominance as the most salient source of variation each semester. Aggression among boys of three years appears antithetical to autonomy. The initially non-autonomous boys appear over time to undergo a transformation from aggression to instrumental dependency (Emmerich, 1966). When seen cross-sectionally from two and one-half years to six and one-half years, the most aggression and dominance are evident in four and one-halfs to five and one-halfs. Friendly associations and contacts increase correspondingly during these years. Children's use of hostility to establish or defend their rights with peers increases with parents' endorsement of statements favoring punitive child control (Marshall, 1961). The amount of action, talk, and aggression that nursery schoolers create for child dolls correlates positively with their use of language and aggression in dramatic play with those peers who create the most fantasy; those who create little for dolls also create little for peers. Aggression with dolls is uncorrelated with aggression to peers. Among under fours, doll aggression is negatively related to dependency, but among fours they are unrelated. Children with problem behavior tend to substitute tangential behaviors, exploring materials, and aggression for fantasy, such that these substitutes for fantasy are better predictors of aggression and dependence than are fantasy scores (Marshall and Doshi, 1965. The overall result suggests that a deficiency of fantasy production is associated with acting out behaviors.

(Situational factors). Clear situational differences emerge among: dramatic play, doll play, and spontaneous reality play between peers, with the first two sharing a fantasy expression component (Marshall, 1961). Situations which constrain the child among threes and fours occur frequently. In a nursery school, the median child experiences about five constraints in one-half hour. Only the bottom 10 percent experience two or fewer. Sex and age differences in constraints experienced are not evident. Types of constraints, expressed as percent of total events, are: desire of one child versus desire of another (31.2); desire of child versus teacher expectation (25.2); desire versus ability (14); overlooked desire for help (13.4); desire versus inadvertant thwarting by group (4.8); desire versus environmental limitations (3.9); desire versus institutional restrictions (3.9). Children's responses to these constraints range from acquiescence to counter-aggression (Jackson and Wolfson, 1968).

(Imitative behavior). Imitation of peer words and sounds is not a frequent behavior during the preschool years (Marshall, 1961). But children of about four years who observe a rewarding peer model, who displays an altruistic behavior produce greater imitative verbal behavior than subjects observing non-rewarding models (Hartup and Coates, 1967). When an adult model provides either nurturance or nurturance withdrawal, or the child receives neither, children around four years in the nurturance withdrawal or control condition, whose dependency scores go up, increase in imitation while those whose scores do not increase show no imitation. The very opposite pattern obtains for the children who experience only nurturance. Imitation may thus aim at restoring the adult's approval (Stein and Wright, 1964). When three to four and one-halfs interact with adult models who vary in rewardingness and future control, recall of the model's behavior is greatest in the high reward-high control condition (Grusec and Mischel, 1966).

(Identification). Identification of dolls, which are dressed like classmates, as representing children increases from age three to four (Marshall and Doshi, 1965). Feminity in nursery schoolers is confounded with measures of adultness. For girls adultness is a form of mature dependency, but for boys the adult role is ambiguous--mother is an important model, but maturity implies the adoption of masculine action. Thus the boy who is maturing most rapidly may also be becoming more feminine, or at least more like his mother. For girls, adult role develops in parallel with positive attention seeking and seems to result from maternal restrictiveness and expectation of more adult behavior, whereas for boys adult role tends to be induced by father's anxiety (Sears, Rau, and Alpert, 1965).

(Resistance to temptation). Children from three and one-half to four and one-half years who are mildly forbidden to play with a preferred toy tend to decrease their preference for that toy, while those who are severely threatened increase in preference for that toy. This effect is still evident 45 days later (Aronson and Carlsmith, 1963). Children who receive explicit instructions regarding how to recognize forbidden blocks can function accordingly, but those given nonexplicit information do not question the lack of explicit criteria and proceed to abstract from the situation whatever information is available in the situation for monitoring their behavior in a different but somewhat similar situation (Moore and Olson, 1969). In a bag-toss skill game, fours conform more to rules with an adult of the opposite sex. For boys attention withdrawal increases cheating (Burton, Allinsmith and Maccoby, 1966).

(Dependency). Directly observed dependent behaviors decline with increasing age, with threes making more contacts with adults than with peers but older children reversing this trend. Threes show six times as many dependent as helpful contacts with adults (Smith and Connor, 1962). Dependency is extracted as a major factor from Beller's 34 scales. It shows a positive stability coefficient over one and one-half years, while in absolute terms it is diminishing in importance as children become older. Instrumental dependency is initially associated with emotional dependency but later comes to signify an alternative to autonomy after age three (Emmerich, 1966). Among under fives, older children show less touching, holding, being near behavior and exhibit more positive attention seeking by verbal methods. Girls shift earlier than boys toward more mature forms of dependency. Evidence for a basic trait of dependency behavior is unsatisfactory for girls and clearly lacking for boys (Sears, Rau, and Alpert, 1965). Stability coefficients suggest developmental transformation for non-autonomous boys from aggression to instrumental dependency between three and five years (Emmerich, 1966). Boys who at age three showed more contact, more attention seeking, and less sustained, directed activity have lower nonverbal intellectual functioning four years later (Wender, Pederson, and Waldorf, 1967). Dependent behavior serves as a more direct, primitive substitute for obtaining gratification, seemingly preempting imitative behaviors among fours (Stein and Wright, 1964). This deficiency of imitation may be related, then, to the later diminished potential in nonverbal functioning.

Three components of dependency among threes and fours are differentially related to manifestations by children of nurturance, with "seeking help" and "seeking physical affection" positively related to nurturance, and "being near" negatively related (Hartup and Keller, 1960). Girls at four seek more reassurance and being near; boys bid for more attention when mother is busy. Dependency is as likely to be expressed toward either sex adult, but with peers toward a child of the same sex. The antecedents for various components of girls' dependency are as follows: for assurance seeking--high demands for achievement from both parents; for being near, touching, and holding--low demands and restrictions without the masculinizing entrance of the father into the girl's rearing; for positive attention--low infant and current caretaking by the mother and a non-permissive attitude toward agression. For boys these are: for positive attention seeking--low father participation and high aggression control by the mother (Sears, Rau, and Alpert, 1965). Girls are higher than boys in dependency on Beller's scales at ages three and four (Emmerich, 1966).

(Transgression). Following an opportunity to be dishonest by peeking, 82 percent of peekers, 15 percent of non-peekers, and 8 percent of controls manifest tension. Peeking children who manifest high tension more than peeking children with low tension reduce dissonance by reducing liking for a non-preferred object and increasing liking for a preferred object. Threes through sixes show no age related differences in this (Brock, 1963). The foregoing objects were not directly implicated in the dishonesty. Under severe threat or non-threat conditions, threes and fours increase their liking for a preferred, but forbidden toy but under mild threat show a slight tendency to decrease liking (Aronson and Carlsmith, 1963).

(Maturity). Helpful behavior increases from three to four to five years. Helpful behavior is, however, quite low among under fives (Smith and Connor, 1962). Nurturance, defined as giving affection, attention, reassurance and protection to others, is relatively infrequent among threes and fours. Its frequency relates positively to "seeking help" and "seeking physical affection" and negatively to "being near" (Hartup and Keller, 1960).

Autonomy is a major factor extracted from Beller's social behavior scales. Autonomy increases in importance from three to four years of age. Among male threes aggression and among female and male fours instrumental dependency seem antithetical to autonomy (Emmerich, 1966). Behavioral ratings of autonomy among threes show high autonomy is more associated with maternal expectations of assertiveness rather than of practical behavior. A father differential favoring practical over assertive behaviors is greatest for medium autonomy girls. Parent and child sex interact on assertiveness, with mother predictions better for their sons than daughters and better than father predictions for sons, and father predictions better for daughters than sons and better than mothers' for daughters (Nakamura and Rogers, 1969). Independence granting and and verbal exchange along with enforced demands and consistent discipline are associated with stable assertive behavior and competence in threes and fours. Techniques which foster self-reliance, whether by placing demands on the child for self-control and high level performance or by encouraging independent action and decision making, facilitate responsible, independent behavior in the nursery school (Baumrind and Black, 1967).

(Sex-typing). Given "little girl" or "little boy" instructions with the IT Scale, three-year-old girls receive more feminine scores under the former instructions than do boys and under the latter instructions, girls receive as masculine scores as do boys. But when the figure is labelled IT, boys receive more masculine scores. Children having siblings make more correct choices under boy or girl instructions (Schell and Selber, 1968).

(Prosocial behaviors). Children increase their mean number of interactions with peers from three to four years, showing a greater degree of inter-relatedness at the older age, but frequency of interactions with the teacher remains unchanged. There is a steady decrease in negative mood interactions with other children and an increase in negative mood interactions with the teacher over the same period (Raph and Others, 1968). Threes make more contacts with adults than peers, while older fours make more contacts with peers than adults (Smith and Connor, 1962). Dramatic play use of suggestion and agreement increases, while reality use of suggestion and agreement remains unchanged with age increase among under fives (Marshall, 1961). Three and one-halfs and fours acquire sharing of marbles with a "child" pictured on an apparatus when reinforced. Older and brighter children acquire such sharing more rapidly. The number of marbles at home does not influence the children but the number in front of them does (Fischer, 1963). The possible role of "Social Abstraction" in these changes is detailed later below.

(Introversion). From Beller's social behavior scales, it appears that the most stable dimension over two years (from three through four years) is interpersonal-impersonal orientation. Interpersonally oriented children are more negative and impersonal more positive, with a developmental transformation somewhere near the fifth birthday which finds the interpersonal-negative child becoming poised and the previously impersonal positive child becoming socially insecure (Emmerich, 1964).

(Conformity). Conformity is not different between boys and girls at three and four, but after that they do become different (Orcutt, 1968).

Social perceptions and communications.--(Status awareness). Nursery school children reject LSES pictures in the life-situation interview. MSES children are superior in such recognition and LSES children do not appear as much aware of or concerned about low status (Estvan, 1965).

(Social awareness). During free play in biracial neighborhoods, ULSES three- and four-year-old children show little awareness of race, class, and religious differences (Gould and Kerckhoff, 1960-61).

(Social abstraction). Among two to four year olds in nursery school, there is a shift in social setting, prominent by three years, from adult-child dyadic to peer group. Total frequency of adult inquiring and informing predicates emitted to a child remains high and fairly constant over these years, although the proportions of particular kinds of information change. The frequencies of self-directed vocalizations and verbal communications remain constant over these ages, but the proportion that such egocentric communications represent of the total of all information-processing predicates is halved among the fours compared to very young children. The adult continues to be an important focus of a majority of the child's verbal-cognitive communications for all these ages. These findings hold for both MSES and LSES children (Honig, Caldwell, and Tannenbaum, 1969). Egocentric speech constitutes about 32 and 31 percent of the total speech of bright and average fours, respectively, in the nursery school setting. These percentages decline among older children. A moderately high positive correlation (.68) between raw egocentricity and social speech suggests that private speech is parasocial and not presocial. Age trends from a separate sample show a sharper and more linear decline of the egocentrism coefficient for bright children and a tendency to increase slightly from four onward for average children, finally dropping at a later time. The coefficient varies with situations, being higher with peers in free play and lower in a task with a minimally responsive adult. Actually, social speech declines for both bright and average children from four years old and upward, perhaps due to greater social awareness among older children of the boundaries of communication with strange adults. In a sample of four and one-halfs, more cognitive tasks induce more egocentric speech than do sensorimotor tasks. These findings overall suggest that the similarity of self-communication and social communication represents not so much a lack of differentiation of the perspectives of self and other as a non-existence of the self's point of view prior to acts of social communication (Kohlberg, Yaeger, and Hjertholm, 1968).

Threes and fours use the double function terms "sweet," "hard," "cold," "soft," "bright," "deep," "warm," and "crooked" only in relation to physical objects; if used with reference to persons, they limit these words to the physical properties of persons. "Sweet" is the only word applied in a non-physical sense (by 70 percent), and many children express surprise and indignation at the suggestion that some of these terms can be used to describe persons. Older preschoolers show some advance toward abstraction in this respect (Asch and Nerlove, 1967).

(Social perceptions, other). Children from four to five years increase in their ability to discriminate on the basis of age. Partial and non-discriminators of age are more likely to associate age with body size, while discriminators use physiognomic cues. Fours are capable of age discrimination (Kogan, Stephens, and Shelton, 1961). Among nursery schoolers, responses to pictures and figures in the life-situations interview reveal that a great number of structural responses classifiable as immediate change to functional responses of an extended nature. Other age-related changes are increases in partial descriptions centering on the human element and general description. Boys are more neutral and girls are more perceptive and have more positive reactions toward the life-situation scenes. In the development of social perception, the recognition component develops most rapidly between three and four years (Estvan, 1965).

(Person preference). Under fives who talk more frequently in carrying out their roles in dramatic play are more often preferred by their peers. For boys, the amount of dramatic play hostility is positively related to being socially accepted. Apparently parents and teachers, who talk with the preschool child about more of the topics which he can use in peer play, enable him to talk about and play these topics more frequently, thereby increasing his chances for social acceptance (Marshall, 1961). Popularity is positively related to the proportion of the child's egocentric speech, particularly among under fives, e.g., for fours this relation is (.50) but for sixes only (.14) (Kohlberg, Yaeger, and Hjertholm, 1968). Affective judgments of age-differentiated child photographs become increasingly positive for younger faces among children in the age range four to six who are older, and also among those who are better age discriminators. Some fours are age discriminators, so behave in this way (Kogan, Stephens, and Shelton, 1961). Using a sociometric choice apparatus on which preferred-friend choices are made by button pushing, threes show longer latencies for lower choices and shorter latencies for more preferred choices. Older fours and younger fives show a clear reversal of these latencies. This suggests an associative type of choosing in younger and decisional choosing in older preschoolers. Teacher ratings of child friendships are of low reliability and show an unimpressive relationship to children's actual choices (Horowitz, 1961). Opportunity to view favored peers operates as an incentive (Horowitz, 1962).

(Emotional communication). In a number of exchange, communication or sharing tasks, primarily involving spatially-oriented pictures as a commodity or focus, preschool children are variously requested to present the commodity to the experimenter, so that he will see it from the same perspective as the child's view of it. Variations of the task produce quite a varied distribution. Generally, the results demonstrate that threes and fours are able to assume the perspective of the other person only sporadically. Fives show a slight improvement and sixes show a marked improvement over younger children. Parental reports of their children's successful and unsuccessful role taking provide essentially the same pattern of age differences (Flavell, 1968).

Motivation.--(Failure/success). Under fives who receive negative reinforcement in a conservation task following any responses to phenomenal shape appear to become confused by the procedure (Braine and Shanks, 1965).

(Reward schedules). Inferential behavior is influenced by reinforcement, as evidenced by threes and fours who receive the major goal during learning trials and who can see the major goal during a test trial performing better than those for whom neither of these conditions prevails (Kendler and Others, 1958). With high as opposed to low reward, fours show a greater mean asymptotic response probability. High reward operates the same way whether received before or following low reward. Children who have received high reward first are reluctant to perform the same task subsequently for low reward (Siegal and Andrews, 1962). When during pretraining some fours receive reinforcement one-sixth of the time and others five-sixths and subsequently complete discrimination problems, the latter group is substantially more successful than the former (mean correct 26.5 versus 17, respectively)

(Steigman and Stevenson, 1960). An individual three-year-old girl showed no cooperative play, little parallel play, rarely used outdoor equipment, clung to the teacher and was almost unresponsive to peers in the nursery school. Following reinforcement for play on equipment, she thereby came into increasing contact with peers, whose reinforcement of her behavior thereafter shaped a wide variety of social skills (Buell and Others, 1968). Sharing behavior with an imaginary peer can be shaped by an apparatus that dispenses bubble gum for sharing, whereas verbal praise is relatively ineffective with three and one-halfs and fours (Fischer, 1963).

(Stimulus variation). Three and one-halfs who have the same visual display presented repeatedly show a steep decrement of fixation and orientation time over just six trials. Response recovery occurs whenever the display is changed. Fixation time at this age seems part of the orienting reflex from both the pattern of response decrement and of recovery. The distribution of attention can thus be a function of novelty and familiarity (Lewis, Goldberg, and Rausch, 1967).

(Preferences). The feasibility of testing the intrinsic interest of toys for children of three and four years is demonstrated by loaning them out to parents who follow a prescribed procedure and return a questionnaire. Toys which hold the interest of 80 percent of ULSES children of this age for at least one week include sound cans, color lotto, wooden table, blocks, flannel board, stacking squares, numberite, and sifo shapes (Nimnicht, Rayder, and Alward, 1970).

(Types of reward). The opportunity to see a picture of a preferred peer as compared to a blue light or a neutral peer causes younger fours to spend more total time and to make more exposures by pulling a lever. Older fours show a higher base rate and higher response rate than younger fours. There are no sex differences (Horowitz, 1962). Isolate behavior in a four year old has been shown to be under the control of thateacher's attention. Making attention consequent upon peer interaction elvates interaction markedly. As peer interaction increases, attention can be given more intermittently (Allen and Others, 1964). The attentin of a talking cowboy puppet can produce and maintain attention in four when their bar pressing energizes the puppet. There is a high positiv relationship between attention-seeking in the nursery school andbehavior to maintain the puppet's attention in the experimental situation(Baer, 1962). Threes and fours show a higher base rate for dropping mables into an apparatus for a male experimenter. Father praise produce lower increments above the baseline; female experimenters produce highr increments than do males; parents produce smaller gains than do eperimenters. None of the foregoing differences seem attributable tosex of the child. On raw scores, however, boys respond less than girls Children tested by parents decrease over trials and those testedby strangers increase marble dropping. Fathers and male experimentrs are generally less effective in delivering verbal social reinforcemnt (Stevenson, Hickman, and Knights, 1963), perhaps because of the nitially higher base rate which they produce.

(Peer effects). In a nursery school peer group, fours givemore total social reinforcement than do threes, with most of this diference due to variations in giving positive attention and approval. Yunger and older boys give equal amounts of affective and personal accetance; younger girls give less than older girls or all boys. Boys givemore submission than girls at both ages. Boys give more reinforcemnt to boys than to girls, and girls give more to girls than to boys. Fours give positive attention and approval (46%), affection and personal acceptance (16.8%), submission (35%), and tokens (2.27%). Threes give comparable amounts of each kind of reinforcement: (positive attention and approval (37%), affection and personal acceptance (16.5%), submission (41%), and tokens (5.5%). Correlations show giving and receiving to be reciprocal activities. Almost two-thirds of all reinforcement is given during dramatic play and none is given during table activity. About one-half of all peer reinforcement is given following an overture from the recipient and the balance spontaneously (Charlesworth and Hartup, 1967). The consequences supplied by the peer group do in fact increase assertive-aggressive behaviors of nursery schoolers. A positively reinforced aggression (e.g., by attention or submission) is likely to be repeated with the same behavior or victim or both. Active children appear to be individuals who are highly responsive to peer-dispensed reinforcers (Patterson, Littman, and Bricker, 1967). Older fours who have received infrequent reinforcement from peers imitate a nonrewarding peer model more frequently than a rewarding model. Those who have been more frequently reinforced imitate a rewarding model more than a non-rewarding model. Overall, those observing a rewarding peer model produce greater imitative verbal behavior than those observing a non-rewarding model (Hartup and Coates, 1967).

(*Higher needs*). Over three months, comparing two and one-half through threes with two and one-half through fours, the two samples became more alike on independence over time, based on rating obtained with Rotter's needs list. On protection-dependency the initially younger and more dependent group become moreso, whereas those in the older group do not. Older boys show an increase in dominance and a decrease in recognition-status behavior, with younger boys showing the reverse pattern. Younger show more love and affection behavior than do older throughout the period. Preschool functions to maintain a fixed degree of homogeneity in each sample group (Tyler and Whisenhunt, 1962). Throughout the ages two and one-half through four there appears a stable positive recognition-status-dominance need cluster which holds to some degree for all ages. For mothers and daughters a generalized expectancy for recognition-status, love and affection, and dominance motives are found, whereas for fathers and sons these expectancies are more independent. For girls, independence tends to be negatively related to all other motives, while for boys independence is either independent of or positively related to other measured needs. There is a definite sex-typing of motivation patterns among MSES parents and their preschoolers on some motive dimensions but not on others (Tyler, Rafferty, and Tyler, 1962).

Of the characteristic sex-typed behaviors, insecurity and curiosity, teachers of fours show the highest agreement on ratings of insecurity. Of multiple curiosity measures, only one positive intercorrelation is found. Also, no reliable relations appear between teacher ratings and curiosity scores (Medinnus and Love, 1965). Two and one-halfs who are followed longitudinally at half-year intervals up to five years (India) show that inadequately nourished children (ULSES) have greater variability of motive scores than adequately nourished, and inadequately nourished girls have lower mean scores than inadequately nourished boys (Werner and Muralidharan, 1970).

Intra-psychic factors.--(Self concept). Recent studies of the coefficient of egocentricity for children's speech show that the similarity of self-communication and social communication in the under-five represents not such a lack of differentiation of the perspectives of self and other as the non-existence of a self's point of view prior to acts of social communication (Kohlberg, Yaeger, and Hjertholm, 1968).

(Personality, global). Protocol materials of comprehensive case histories are reliably enough Q-sorted to permit longitudinal comparison with children as young as the toddler level. Ideal preschoolers are described as productive, affectionate, involved in a wide range of activities, enthusiastic about them, having resilient egos, and showing concern for others. An age typical image shows many of these strengths, plus signs of two kinds of difficulties: 1) poor impulse control indicators (labile, disorderly, messy, undercontrolled, and unmodulated in affect) and 2) those reflecting phallic-phase sexual concerns (jealous, concerned about the body, competitive, anxious, and interested in heterosexual matters). High reliabilities are obtained for both normal and clinical protocols of three and one-half- to four-year-old Jewish children. Specially trained teachers rate as well as do clinicians. The sort is sensitive to developmental pathology of "normal" children (Schachter, Cooper, and Gordet, 1968). Using 81 objective test response measures, twenty factors appear in fours. Although there are systematic changes in factor pattern emphasis between four years and adulthood, the number and nature of the factors stays remarkably constant (Cattell and Peterson, 1959).

Among parents of three and one-halfs and fours, MSES mothers' authoritarianism is related to their power assertion. Variables which influence the relation between parent personality and disciplinary behavior are parent's position in marital relationship, child-rearing norms as opposed to direct expression of the motive, and outside opportunities to express the motive (Hoffman, 1963).

(Adjustment). The Nursery School Adjustment Scale and Later School Adjustment Scale can, as in the Q-sorts above, be applied directly to school records. Gross nursery school adjustment ratings correspond in 78 percent of cases with later use of mental health facilities for low adjusted and non-use in the case of high adjusted. The most predictive items are relationship with peers and teacher, creativity in individual activities, signs of behavioral maturity, signs of behavioral eccentricity, and family criteria. Observations of children's relation with people have more predictive significance than those based on the individual child. Relationship with peers strongly correlates with later authority relations. Being from an unstressed family is associated with high later achievement (Westman, Rice, and Bermann, 1962). Treatment of mildly to moderately emotionally disturbed threes and fours through the mother is highly successful both on short-term and long-term follow-up (Furman and Katan, 1969). A true actuarial rate for clinically established adjustment problems in UMSES preschoolers is 31 percent, with nearly 70 percent of these cases appearing between 36 and 72 months and 62 percent of the cases being boys (Thomas, Chess, and Birch, 1968). Most of the foregoing cases, at their first appearance, are behavior disorders of mild to moderate severity.

(Activity level). The dimension active-passive shows decreased applicability for describing four and one-halfs as compared to younger children (Emmerich, 1964). The active child in nursery school appears to be one who is highly responsive to peer-dispensed reinforcers (Patterson, Littman, and Bricker, 1967). The activity level (motility) becomes a primary basis for diagnostic sorting into active and passive behavior disorder groups. Clinical groups as compared with normals are characterized by an excessive frequency of both high (actives) and low (passives) activity, irregularity (passives), nonadaptability (both groups), intensity (both groups), persistence (both), and non-distractibility (both). Passives are initially low in overt intensity but increase by the preschool period (Thomas, Chess, and Birch, 1968).

(Emotionality). Factor analysis of temperament characteristics yields a factor in which positive mood, mild intensity, approach, and adaptive behavior are scored in one direction and their opposites in the other. From this it appears that symptoms expressed at the preschool level are primarily at the overt behavioral level, although by school age these may be expressed as reflecting complex subjective states, attitudes, distorted self-images and psychodynamic patterns of defense. Anxiety is not evident as an initial factor preceding and determing symptom development, but it is a consequence instead. Removal of symptoms has positive consequences (Thomas, Chess, and Birch, 1968).

(Reactivity). The developmental courses of threshold and intensity cross over for non-disturbed versus disturbed, with non-disturbed showing a rising threshold and dropping intensity and disturbed showing opposite courses by the preschool period. This is true despite the fact that active disturbed children and normals are similar in these respects in infancy, and despite the fact that passive disturbed children start in infancy with both the highest threshold and lowest intensity. Guidance of parents is markedly or moderately successful with an overall two-thirds improvement rate for children. For a subgroup of distractible non-persistent children, however, guidance is not successful. A direct relationship is evident between parental responses to guidance and the child's improvement (Thomas, Chess, and Birch, 1968).

(Fantasy). Among under fives using dolls dressed like adults and classmates in their room doll-play action is positively related to talk between child dolls. Age is related to amount of action between child and adult dolls, identification of dolls as children, and use of dolls as a medium for fantasy. The amount of action, talk, and aggression which the child creates for child dolls correlates positively with the frequency of his use of language and aggression in dramatic play with those peers who create the most fantasy in their play; those who create little dolls do the same for peers. Fantasy created for child dolls is higher for children whose associative play and interactions with peers are high. Aggression through dolls is unrelated to reality aggression toward peers but is positively related to dramatic play aggression. Real aggression to peers is unrelated to any doll-play fantasy scores. Children who are more aggressive to peers name fewer dolls as nursery school children. Girls create more action between child and adult dolls than do boys. The significant relation of doll-play scores with age suggests an increase of creation through doll play with increasing age during the preschool years. Children who use substitutes for fantasy (tangential behavior, exploring materials, overt aggression) have higher rates of problem behavior. Thus, fantasy substitutes are better indicators of aggression and dependency than are any fantasy scores. If problem behavior is expressed during doll play, it is expressed directly to the materials and people present rather than in the creative world of fantasy. Thus, among MSES preschoolers, doll play appears to be a better tool for the education of ideas and feelings of children who are doing well than of children with problems (Marshall and Doshi, 1965).

Pitcher and Prelinger have used a method of taking preschoolers aside in the classroom and asking them to "Tell me a story. What could your story be about?" Only original stories are included in their samples, with repetition of standard stories omitted. Under these conditions, both sexes show increasing expansion of their use of space from three to five years. They also show decreasing external differentiation of their main characters, because of their use of increasingly varied characters. Over time they show increasing inner complexity of characters, increasing fantasy, decreasing "realism," and initial evidence of using "planning." There are no clear age differences in the rates of thematic treatment of aggression, death, hurt or misfortune, morality, nutriance, dress, sociability, and crying. Fathers are clearly of lower saliency than mothers for children at all these ages, and positive mentions are higher than negative mentions for both parents. Using an Eriksonian framework to view their fantasy production, no age differences appear for trust, but girls evidence more of this theme than boys. The theme autonomy is higher both at three and five years than at four for boys and girls. Initiative increases over time for boys only, who also show greater evidence of this theme. Industry is just beginning to increase for boys but is minimal for girls (Pitcher and Prelinger, 1963).

(Adaptability to demands). Parental practices which are intellectually stimulating and to some extent tension producing (e.g., socialization and maturity demands) are associated with various aspects of competence among threes and fours. Independent assertive behavior in girls is is associated positively with parental demands and negatively with high acceptance. Firm demanding behavior on the part of the parent shows no relation to punitiveness or lack of warmth (Baumrind and Black, 1967).

(Attachment). Studies by Madame Gouin Decarie, although done with children younger than the preschool age range, deal with affective deviations which may well be manifest as disarranged sequences of development among threes and fours who have experienced disruptions of parental relations. This is likely among ADV children as well as DADV children, although at differing rates. In comparisons of children living with their own parents (Group 1), with adoptive parents (Group 2), and in institutions for orphans (Group 3), variability in Piagetian levels of cognitive development of "object relations" is greater for Groups 2 and 3. Absolute differences in level of cognitive development are also evident as a function of degree of disruption of attachment formation. Nevertheless, a relatively invariant cognitive sequence is evident in all groups. On the contrary, for early affective relations with people as objects, not only is degree of disrupted attachment associated with greater variability of affective attainment, but also with deviant sequences of developmental progress. Overall rankings across cognitive and affective object relations development are positive, indicating somewhat parallel courses of appearance. Consistently more advanced levels of cognitive and affective development appear in descending order from Groups 1 through 3. Yet in affective development no only retardation but also profound deviations of order are evident particularly among children of Group 3 (Gouin Decarie, 1965).

Social-cultural-familial influences.--(On general development). Fours who are from nursery school classes that are high in supportive discipline (as opposed to punitive or permissive) show higher developmental maturity in their human figure drawings. The differences are impressive even though the groups overlap some (Reichenberg-Hackett, 1964). Among threes and fours, parental techniques which foster self-reliance, whether by placing demands upon the child for self-control and high-level performance or by encouraging independent action and decision making, facilitate the child's responsible, independent behavior (Baumrind and Black, 1967).

Advantaged Anglo five-year-old children

Social behaviors.--(Aggression). Empathy is unrelated to aggression for girls. Among six- and seven-year-old boys these variables are negatively related, whereas in fours and fives they are positively related (Feshbach and Feshbach, 1969).

(Situational factors). Among five and one-halfs the attention of peers, who frequently provide contingencies for a particular child's behavior, or the withholding of attention controls such behaviors as cooperation, aggression and speech. Thus a child's behavior in free field settings is subject to the reinforcement control of his peers (Wahler, 1967).

(Maturity). Among fives, a relation is found between maternal employment and household tasks performed by children (Powell, 1961).

(Sex-typing). Both boys and girls of five and six years avoid play with inappropriate sex-typed toys more than do under fives. The presence of an adult makes no difference in girls' behavior, but is more likely to suppress sex-inappropriate toy selection among older boys than among younger (Hartup, Moore, and Sager, 1963). Among kindergarten boys, about 70 percent draw male figures first (sex-role orientation) when requested to draw a person. IT scale choices are positively correlated with this

(.58). Sex-typed toy and game preferences correlate positively (.76). Boys whose fathers are present at home have higher male sex-role orientation than do father-absent boys. Father's behavior, including his interaction with the mother, is also important in the development of sex-role orientation. A high level of maternal encouragement seems facilitating, but father power is most significant for boys' development of sex-role preference (evidenced by game and toy preference). In addition to father power, the child's mental age and physique influence sex-role adoption, as rated by teachers (Biller, 1968). Father-son variables are more directly associated with boys' sex-typing than are mother-son variables. High masculine boys behave more affectionately with their fathers, come from families that are less strict about noise and more frequently give praise as a disciplining technique. High masculine boys also show more conscience development (Mussen and Distler, 1960). Father-present as compared with father-absent boys (both being MSES) show more masculine game preferences, identify IT more often as male, and maintain IQ level (while that of father-absent boys drops) over two years. In father-absent cases only, maternal encouragement shows a positive relationship to both game preferences and ratings of masculinity (Biller, 1969).

Social perceptions and communications.--(*Status awareness*). By five years of age only 2 percent of children lack both color meaning and racial awareness, while 64 percent have both concepts (Renninger and Williams, 1966). Various reinforcement procedures reduce the tendency of fives to give color meaning responses. Racial attitudes show no transfer from this change (Williams and Edwards, 1969). Intelligence is unrelated to fives' tendency to recognize a group of racially-mixed dolls as a family, nor do they refrain from calling a black child doll the child of white parent dolls regardless of parental attitudes (Diamont, 1969).

(Social perceptions, other). A Social Expectation Scale based on Heider's theory reliably measures expectation of benevolence from other people and expectation of self interest; somewhat less reliably expectation of another's motivation, desire for equality of outcome. Kindergarteners judge the attractiveness of a selected alternative without considering that the other had to choose between two specific alternatives; thus, they reject a choice situation which provides for an unattractive alternative. These children expect more benevolence and less self-interest from other people than do older children or adults (Baldwin and Others, 1969).

(Emotional communication). Some fives begin to show that they can use the structure of a context to reach more refined estimates of affective communication than is possible from isolated events (Gotts, 1971b). In detecting vocal communications of emotion, compared to older children fives disproportionately recognize "loving" and fail to recognize "sadness." Boys are more accurate than girls, especially on the negative emotions. Sadness is better recognized with male voices and happiness and loving from female voices. Both sexes better recognize anger from the same sex adult (Dimitrovsky, 1964).

Motivation.--(Threat). NSES children ranging in age from 57 to 70 months devalue a forbidden toy more after mild threat and less after severe threat (Ostfeld and Katz, 1969).

(Preference). By age five many ADV children have shifted from color to form as a basis for attributing object similarity (Gotts, 1971a). Kindergarteners' statements of story preference indicate the following percentage interests in particular themes: Negro heritage (79), children in ghetto (63), history and science (59), children in general (46).

fantasy (35), and animals (22). Of the most disliked pictures four each relate to fantasy and animals (Ford and Koplyay, 1968).

(Types of reward). Token social reinforcers are about 3 percent effective, even in very short-term usage, for influencing children's attention to particular environmental attributes (Gotts and Tach, 1969). Fives' preferences for material reinforcers from most to least desired are bubble gum, ballon, rat fink, chiclet, marble, candy corn M & M, penny, toy cow, washer, paper clip, bean (Haff, Feldstein, and Witryol, no date). Kindergarten MDES children do not differ across social versus material reinforcement. Boys and girls do not differ in learning six words under reinforcement (Pikulski, 1970).

Intra-psychic organization.--(Orderliness). Persistence and social stubbornness are not the same trait among fives, particularly for boys. For girls, orderliness is closely related to obstinacy and parsimony. Obstinacy does not have unitary behavioral referents (Hetherington and Brackbill, 1963).

(Creativity). Creativity is unrelated to IQ across ten different measures of creativity. About two-thirds of these multiple measures are significantly positively related. A small correlation suggests that MDES children are slightly more creative. Creativity is not related to either sex-role orientation or preference, but boys with mixed sex-role patterns demonstrate higher creativity than those with a consistent pattern (Biller, Singer, and Fullerton, 1969).

Advantaged Negro five-year-old children

Motivation.--(Threat). Mothers of these children do not differ from those of other SES levels in use of punishment. Fathers of MSES punish less severely behaviors defined as antisocial and annoying (Hervey, 1968).

Intra-psychic factors.--(Personality, global). Preschool experience has no measurable effect upon a shortened version of the California Test of Personality, but MSES are rated by teachers as better adjusted. This test appears to be of questionable validity for disturbed children. The children do not answer many of the questions, particularly those of some emotional import (Bittner, 1968).

Social-cultural-familial factors.--(On program gains). Parents whose participation in their children's preschool readiness program is rated as good or fair have children of higher IQ; poor participation parents have children of lower IQ; no participation have lowest IQ. But greater gains in IQ are made by children whose parental participation is fair or poor. Children whose parents show good participation do not make gains because they have already benefited as much as they can. Non-participating parents' children show no gains, apparently because of parental inhibition of development (Bittner, 1968).

Advantaged five-year-old children with unidentified or mixed ethnic background

Social behaviors.--(Aggression). Aggression-dominance accounts for a large amount of over-all rated social behavior of fives (Emmerich, 1966). Aggression and dominance seem to peak at age five (Marshall, 1961), being lower before and after this age. See also Family Factors.

(Family factors). Parents high on hostility, restrictiveness or sex anxiety tend to come in pairs. Hostility of both parents and use of physical punishment are strongly related to aggression in kindergarteners, as are mother's childrearing anxiety and father's strictness. The relation of maternal use of physical punishment to aggression is almost linear for boys and girls at home and for boys at school, but for girls at school moderate punishment leads to greater aggression. Boys moderately punished by fathers are less aggressive at home and school, while paternal hostility and punishment of daughters are linearly related to their aggression at both home and school (Becker and Others, 1962). On the Social System Interview, MSES mothers are lower than LSES on system-size, care takers, disagreement, direction, and outside visits, while being higher on stability, assertion, and playmates (Weber, no date).

(Imitative behavior). Among USES girls, adult attention as compared to withdrawal of attention results in greater tendency to use the same color pencil as the adult to trace a maze. Boys do this only for a male adult, but girls for either sex. For boys and girls combined, an attentive adult of the opposite sex, compared to one who is not attentive, produces more imitative color matching (Rosenblith, 1961). Five-year-old girls with nurturant mothers do not differ on imitative goal related responses on the Porteus Maze from those with low nurturant mothers, but they do show greater incidental imitation than the latter (Mussen and Parker, 1965).

(Resistance to temptation). Kindergarten girls as compared with boys show almost twice as much hesitation delay, suggesting earlier self-control development (Ward and Furchak, 1968).

(Dependency). Five-year-old girls with more nurturant mothers are rated by teachers as less dependent (Mussen and Parker, 1965). Fives show more contacts with children than with adults, and their contacts with adults are twice as likely to be dependent as helpful, although helpful behaviors are increasing and dependent decreasing (Smith and Connor, 1962). Others find this dependency decline (Emmerich, 1966). Among younger fives nurturant behavior is positively associated with the dependency components "seeking help" and "seeking physical affection" and negatively associated with "being near" (Hartup and Keller, 1960). At age five instrumental dependency is an alternative to autonomy. Girls exceed boys in dependency (Emmerich, 1966).

(Transgression). Tension behaviors are prominent in children who peek compared to those who do not, when it is forbidden. The peekers who show high tension compared to those with low tension reduce dissonance more (Brock, 1963).

(Maturity). Helpful behaviors of children are higher at five years than when children are younger (Smith and Connor, 1962). Younger fives are more likely to extend nurturance by giving positive attention (Hartup and Keller, 1960). Autonomy is on the increase among fives (Emmerich, 1966). Children already benefiting from MSES home and community are not on the average more mature at kindergarten age as a result of prior preschool experience, according to both parents and teachers (Willer, 1968).

(Sex-typing). Among fives of MSES and HSES, IT is not seen as male by most children. Boys have both more variable scores and more masculine scores than do girls (Lansky and McKay, 1963).

(Prosocial behaviors). Fives more than younger children are likely to initiate peer interaction (Raph and Others, 1968). However, these approach behaviors more often take the form of aggression or dominance at this age. In dramatic play fives use more suggestion and agreement than do younger children, but their reality use of these is not different (Marshall, 1961).

(Conformity). Girls' conforming behavior gradually rises up to age five, whereas boys' drops sharply between four and five, resulting in a sex difference at age five (Orcutt, 1968).

Social communications and perceptions.--(Social abstraction). Fives mainly understand sweet, hard, cold, soft, bright, deep, warm, and crooked in object reference, and when they apply them to persons they do so primarily in their physical sense. With these terms they describe psychological properties in only about 17 percent of the cases where this is possible. Yet they are more abstract in this respect than under fives (Asch and Nerlove, 1967).

(Social perceptions, other). Fives discriminate age differences in photographs more than do younger children (Kogan, Stephens, and Shelton, 1961). Fives who make family drawings often omit siblings, to a lesser extent omit either father or self, and occasionally omit mother. Few yet draw clothing to indicate sex. They show mothers as active in the home (Lee and Pimentel, 1969).

(Person preference). Fives respond more positively to photographs of younger faces; age discriminating children especially do this. Age discriminators use physiognomic cues, while partial and non-discriminators use body size (Kogan, Stephens, and Shelton, 1961). Fives show longer latency before selecting preferred peers' photos than non-preferred peers' photos displayed in an apparatus. This is exactly opposite the reaction of younger children (Horowitz, 1961).

Motivation.--(Threat). Fives who are informed in advance of a penalty for being incorrect make fewer errors than no-penalty subjects (Stevenson, Weir, and Zigler, 1959).

(Reward schedules). Jewish fives choose a larger delayed prize over a smaller immediate one 50 percent of the time, and 32 percent choose the other alternative (Zimiles, 1967). Delayed reward initially seems to frustrate kindergarteners (Rieber, 1964), and operates most strongly near the goal (Sheikh, 1968), being evidenced by children slowing down following reward delay. Rate of increase in lever responding for marbles is greater under low than high reward. Persistent children show an initial fast rise followed by decline. On extinction, high reward subjects persist longer. Persistence and reward interact such that low reward-high persistent children are highest in performance and high reward - high persistent children are lowest in performance (Nakamura and Ellis, 1964). Lever movement speeds decrease when amount of reward is increased during training, and increase when amount is decreased (Bruning, 1965).

(Stimulus variation). Fives respond longer during extinction of a discriminated response to "smaller" when they are presented with fewer of the incidental stimuli which accompanied reinforcement during acquisition. This may be interpreted as indicating that extinction occurs more rapidly when familiar stimuli continue to be encountered (Viney and Others, 1968). Attention of fives is greater when novel materials are presented on television. Teachers who move about more also produce more attention, and cartoons produce more attention than other programs (Palmer and Others, 1968), presumably because of the stimulus variation which they provide. Palmer also finds that five-year-old children show an increasing interest in program segments,compared to younger children.

Intra-psychic factors.--(Behavioral pathology). In a sample o 77 percent Anglo and 23 percent Negro, increased family size is ass positively with school problems and antisocial behavior and negativ anxiety and neurotic symptoms (Tuckman and Regan, 1967).

(Self concept). Middle and working SES kindergarteners who ve a high ratio of self-reference (evidencing preoccupation with self characteristics) later show lower success in reading. Self concept ego strength are more predictive of later reading success than is m ability. Self concept as to competence, rather than as to goodness naughtiness, is more related to academic achievement. The self con is measured better by an indirect test given to the child than by t ratings (Wattenberg and Clifford, 1962). Correlation of IQ with th going measures is low, so they add to the predictive efficiency of r ability (Wattenberg and Clifford, 1964). Kindergarteners with more autonomous self-evaluations show more independence, achievement, an affiliative behaviors, while less autonomous self-evaluations go wi control of impulses and less stable level of aspiration (Dreyer and 1966).

(Personality, global). Initial differences are absent on a sh form of the California Test of Personality between children who hav tended a preschool program and those who have not. But another yea at the beginning of second grade, the former preschool group is show greater social adjustment. All groups, in fact, gain in social adju Findings with this instrument suggest that initial school experienc duces loss in self-reliance and increase of anti-social tendencies (Bittner, Rockwell, and Matthews, 1969).

(Adjustment). First grade adjustment, rated by teachers, is higher for children who have attended kindergarten. Those of UMSES are rated as of higher adjustment than those of LLSES (Hammond and Skipper, 1962).

(Locus of control). Kindergarteners who possess a feeling of internal control of reinforcement (IRC) with reference to achievement behavior and to social behavior changes receive more teacher approval for achievement behavior. Low IRC children show less achivement striving behavior (Reimanis, 1970).

(Fantasy). In their own story telling, expansion of spatial orientation is up for girls at five but steady for boys from four to five. Boys produce greater variations of main character at five, with the number remaining steady for girls. Inner complexity of characters is up for both sexes. Fantasy is higher and realism lower in stories at five than at four. Planning is beginning to inch upward, but action is predominant. Autonomy content is higher at five than at four. Boys are higher in initiative themes at five than at four and higher than girls (Pitcher and Prelinger, 1963).

Social-cultural-familial influences.--(On program gains). Working class fives who have been to preschool show a slightly better kindergarten adjustment than do those who have not. Family involvement in the preschool classroom allows for a more successful break from the parents (Axtell and Edmund, 1960).

Advantaged Anglo children, mixed ages

Social behaviors.--(Aggression). Among children of 37 to 67 months, those exposed to aggressive models show higher imitative responses but no more non-imitative aggression than do low aggressives. The behavior appears, thus, to be one of differential social responsiveness to particular adult cues. Around a non-aggressive model, both sexes show greater sex-typed play and play more quietly. Physical aggression is elevated in both sexes by a male model. Adult aggression apparently communicates permission and thus weakens inhibitory responses (Bandura, Ross, and Ross, 1961). ADV children display both less hostility and warmth than DADV (Kagan and Wimberger, 1967).

(Family factors). Top and bottom quartile mothers on authoritarianism exhibit differing amounts of restrictiveness; mothers extreme on hostility-rejection (high versus low) show differences in interactive play, verbal interaction and non-attention; more democratic mothers have children who show a higher rate of compliance; and mothers high as disciplinarians show more directing and restriction (Brody, 1965). ADV children are less dependent on siblings than DADV (Hillery, Lindgren, and Remstad, 1969). Among fours and fives ADV as compared with DADV mothers provide more social reinforcement and fewer authoritarian interventions, and ADV mother-child dyads show more affection-based interactions (Kagan and Wimberger, 1967). Mothers of MSES background who are told that their child is "unstructured, unimaginative or immature" provide four times more directing, nine times more helping, five times more structuring, and three times more teaching behavior than do LSES mothers under this condition (Walters, Connor, and Zunich, 1964). See also Imitative Behavior below.

(Imitative behavior). Anglo fours through sixes engage in more imitative aggression when an Anglo model is reinforced for aggressing, but the very opposite is true for Negro children (Thelen and Soltz, 1969). Indirect measures of imitation, for example, those obtained through an "ego" doll, are intercorrelated at a low positive level consistently, with children showing a slight preference for same-sex model from three to five years. Cross-sex choice is not supported. Children are more likely to imitate when the response alternative is not imitative (Hartup, 1964). See also dependency below.

(Dependency). Low dependent children (3-9 to 5-5) obtain higher intentional learning scores, and high dependents show more incidental learning and learn more of the completely irrelevant responses. The former children are more likely to communicate to parents facts which they have learned, while the latter describe equipment or other non-task aspects of the environment. In a post office game, high dependents prefer a customer role and low dependents prefer a controller role. Generally low dependents seem to display "sharpening" cognitive control toward the model (Ross, 1966).

(Sex-typing). When a non-aggressive model is present with the child (37-67 months), both sexes show more quiet sex-typed play (Bandura, Ross, and Ross, 1961). Opposite-sex imitation is absent and same-sex imitation is present, although in only a slight amount at ages three through five years (Hartup, 1964).

Social perceptions and communication.--(Emotional communication). Threes through fives show an increasing tendency with increasing age to use accurately the evaluative and activity dimensions of emotional meaning to describe the characters' expressions when viewing cartoon characters. Individual differences in selective attention to such emotional expression reveal that older preschoolers who attend more to emotion are more responsive to social reinforcers (Gotts and Teach, 1969).

Motivation.--(Stimulus variation). Children who receive more varied colors of marbles from a dispenser stay at the task longer than those receiving the same schedule of marbles but of less varied colors. Facial change reveals surprise more frequently and intensely for children who are provided a discrepancy between input and output (Charlesworth, 1964). Fours and fives who have been taught a motor skill by continuous identical practice show more spontaneous alternations, while those who have been exposed to repeated novelty show fewer than chance alternations (Ellis and Arnult, 1965).

(Preference). Older preschool children (4-0 to 6-0) generally prefer form over color or size as a basis of similarity matching. A group test for measuring this also is used to determine when the form attending is simply associative and when it is more conceptually regulated (Gotts, 1968b). Various minimal influence conditions, however, affect the absolute level of such responding. ADV children shift more rapidly from color to form attending than do DADV.

Intra-psychic factors.--(Creativity). Both more highly rewarded and HSES membership children display more divergent thinking. Higher IQ Anglos are less likely to think divergently than lower IQ Anglos, whereas the relation of IQ is reversed for Negroes (Savoca, 1965).

(Personality, global). Among combined fours and fives boys employing a descriptive part-whole approach in their categorizing tend to be relaxed and control their emotionality but the girls are non-cautious or impulsive, day-dreaming, and inattentive. Girls who show descriptive global style resemble the above group of girls: non-anxious, uncontrolled emotionally, not cautious, relaxed, not ambitious, and inattentive. Boys of this group are more independent. Boys of relational-contextual style show lower emotional control, with the opposite being true of these girls (Sigel, Jarman, and Houston, no date).

(Controls). ADV as compared to DADV children (4-8 to 5-7) are less impulsive and more reflective on a perceptual task or one involving manipulation to discriminate objects (Hambauer and Miller, 1969).

(Fantasy). In the preschool age range, the distinction between reality and fantasy is somewhat arbitrary, since the child uses fantasy as a means for accommodating progressively to reality through the formation of symbols and cognitive structures. From four or five years up to about seven, representational play, imitation, and conceptual representation are positively related. Intuitive thought during this period attests to the importance of imitation and imaged accommodation during the onset of representational thought (Piaget, 1962).

Social-cultural-familial influences.--(On program going). Mother's brief preschool visits during the child's (ages 3 ½ through 5 years) entry into nursery school show no facilitative effect upon the child's emotional adjustment to the setting (Schwarz and Wynn, no date), probably because of the treatment's brevity and the fact that suburban MSES children are already prepared for this experience.

Advantaged Negro children, mixed ages

Social behaviors.--(Imitative behavior). ADV Negro children (4 to 6 years) who view an Anglo model being reinforced for aggressive behavior are less likely to imitate his behavior than if he is not rewarded: apparently the reinforcement serves as a cue that he would be punished for the same behavior. The reaction is exactly opposite to that of Anglo children (Thelen and Soltz, 1969).

Intra-psychic factors.--(Creativity). Divergent thinking is higher among higher SES Negro children. Higher IQ Negroes are more divergent than lower IQ, while the opposite relation obtains among Anglo ([illegible], [illegible]).

Advantaged children of unidentified or mixed ethnic background, mixed ages

Social behaviors.--(Aggression). Imitative aggression of boys is three times that of girls, but non-imitative motor aggression of girls is twice that of boys. Non-imitative verbal aggression of boys is higher, especially for those exposed to a male model (Madsen, 1968). Imitative aggression is regularly and predictably induced at mean age [illegible] months, with boys imitating more than girls and being especially high after a male model. Adult-male aggression effects on boys are more lasting than non-male effects. After film-mediated aggression, retention is even greater than is apparent immediately following performance of aggression (Hicks, 1965). Frustration does not produce aggression as readily as frustration preceded by exposure to aggressive models (Bandura, Ross, and Ross, 1963).

(Dominance). Among threes through fives, the ratio of friendly to unfriendly acts occuring between pairs of children is directly related to subsequent mean physical distance maintained between them in a sand play area when one of the children is rewarded for staying at a particular spot in the sandbox (King, 1966).

(Family factors). For UMSES children (ages 4-1 through 5-7), a constellation of independence and warmth appears to accompany maternal sanctions for assertive behavior. Aggressive boys seem to be rewarded by mothers for aggression, whereas aggressive girls seem to be reacting to frustrated dependency. Mothers of girls accept dependency more readily than do mothers of boys. Maternal rejection (both hostile and laissez-faire forms) is associated with more subdued, internalized, and socialized forms of aggression in boys and with outer-directed aggression in boys and restless activity in girls, a sex-inappropriate pattern of aggression for both sexes (Hatfield, Ferguson, and Alpert, 1967).

(Imitative behavior). With prompting followed by reinforcement for matching the experimenter's behavior, imitation develops quickly among fours and fives. New, unprompted and unreinforced behaviors which are interspersed among previously reinforced ones are imitated quickly. Both release from instructions to imitate and non-reinforcement lead to response decrements. For boys noncontingent reinforcement prolongs imitation (Waxler and Yarrow, 1970). Children assigned to nurturant or non-nurturant teacher conditions who subsequently view their own teacher versus an unfamiliar model performing identical aggressive behaviors manifest no difference between base rate and post-film scores. Imitative aggression of boys is three times that of girls, but non-imitative motor aggression of girls is twice that of boys. Non-imitative verbal aggression of boys is higher, especially for those exposed to a male model (Madsen, 1968). Imitative aggression is regularly and predictably induced at mean age 61 months with boys imitating more than girls and being especially high after a male model. Adult-male effects on boys are more enduring than peer-male effects. Both sexes aggress more following film-mediated aggression. Retention is even more pronounced than immediate performance (Hicks, 1965). Films likewise are imitated for both human and cartoon models, the first more strongly; both are more potent than a live model among 35- to 69-month-old children.

Boys imitate more. Frustration also does not produce aggression as readily as does frustration preceded by exposure to aggressive models (Bandura, Ross, and Ross, 1963). Children watching an adult press buttons at a control panel imitate more easily, readily, and consistently if a token and the experimenter's social response are both positive or both negative, suggesting the role of attention in imitation (McDavid, 1962).

(Identification). Imitation of like-sex parent and appropriate sex-typing are positively related for girls, but not for boys (aged 3-6 to 5-6), although both sexes imitate the same-sex parent more, with this latter finding more pronounced among older children. Maternal authoritarianism relates to same-sex parent imitation by both sexes (Hartup, 1962).

(Dependency). Less dependent children show higher achievement effort among three through fives (Crandall, Preston, and Rabson, 1960).

Comparing boys only to boys with one sister (ages 38 to 85 months), in boys-only families the older the preschool son is, the more masculine the father and the more feminine the mother; in families with at least one son, the older he is the more feminine the father. Mothers of girls only are more feminine and fathers more masculine as their daughters are older. For girls with brothers the older the girl, the more feminine the father. In families of mixed-sex sibling composition, older preschoolers of both sexes have more feminine fathers; all same-sex sibling families show reversal, with father being more masculine as preschoolers are older (Lansky, 1964). Parents of boys have more polarized attitudes on sex-typing. Fathers of boys differ more from fathers of girls than mothers of boys differ from mothers of girls. Parents (especially fathers) express more positive attitudes toward boys' same-sex choices and more neutral attitudes toward girls' cross-sex choices (Lansky, 1967). Boys' (ages 4-8 to 6-2) sex role orientation (O), preference (P), and adoption (A) are all positively related. Boys' perception of father dominance strongly relates to boys' masculinity. A boy's behavior seems most determined by his particular perception of reality, with the effect in descending order: O, P, A (Biller, 1969).

(Prosocial behaviors). Threes through fives using an experimental apparatus for promoting cooperative behavior show no reliable increase and appear to be learning to press knobs only (Brotsky and Thomas, 1967).

Motivation.--(Reward schedules). Fours and fives given candy reward do not perform as well as those given punishment or reward-punishment combination, for Negro and Anglo mixed (Spence and Dunton, 1967). Children (49 to 71 months) who receive low reinforcement or who have an opportunity to compare their reinforcement to another child's engage in greater self-reinforcement (Masters, 1969). Preschoolers (4-2 to 5-8) select a delayed larger reward; and those who pick the smaller, immediate reward show shorter decision latencies (Lang and Adair, 1968). Left-right position preference interacts with percentage of reinforcement differential, outweighing alternation effects as a determiner of choice behavior among fours and fives (Weir, 1964). Adult actions are more discriminable from the child's own actions than are a peer's and thus are more commanding of attention and in turn more easily reinforced (Baldwin and Levin, 1964).

(Stimulus variation). Children (3-3 to 5-7) who are pre-exposed to toys from which they later choose increase in preference over later trials for non-familiar toys in inverse proportion to their prior exposure (Endsley, 1967). Similar findings are obtained in other studies, with the additional datum that low anxiety children (3-7 to 5-6) prefer higher novelty in toys (Mendel, 1965). After a controlled amount of pre-familiarization trials, fours and fives prefer viewing a novel picture, increasingly with degree of familiarity of the alternatives (Leckart, Briggs, and Kirk, 1968). Children (3-0 to 5-11) respond longer on extinction after 50 percent than after 100 percent reinforced trials (Fort, 1961).

(Preference). A previously non-desired (neutral) object which is spoken of favorably to the child (3-6 to 5-6) increases its ranking within the hierarchy of the child's preferences (Witryol and Alonzo, 1962).

(Types of reward). Mixed Negro and Anglo children do not respond as well to candy reinforcement as to social reinforcement (Spence and Dunton, 1967).

Intra-psychic factors.--(Adjustment). Paintings by disturbed and non-disturbed threes through fives are significantly recognized by judges as indicative of adjustment level (Smith and Appelfeld, 1965). Special attention from volunteers in an informal program may be beneficial to maladjusted preschool children (Wilson, 1965). Parental ratings of child adjustment are generally lower than those made by teachers, the latter agreeing more highly with school marks (Cassel, 1964).

(Emotionality). ADV children (3-7 to 5-9) who are placed in a room with a large toy gorilla display more unpleasant emotion with mother present and apparently inhibit both motility and emotional communication when a stranger is present (Schwarz, 1968).

(Controls). Decision time of children (3-5 to 5-5) positively relates to social inhibition. The child's manifest social uncertainty relates positively to the magnitude of discrepancy between parents in child-rearing attitude and behavior and to the degree that mother exceeds father in warm personal contact (Wyer, 1965). For girls guilt over deviation does not yet provide adequate regulation for resistance to temptation. It seems more a manifestation of concern over possible loss of nurturance than of internalized conscience. More guilt is shown by those who are more securely identified with the mother. For boys a less coherent picture emerges, perhaps because of shifting from identification with mother to a secondary identification with the father. Boys who are more resistive to temptation are less aggressive in overt behavior and fantasy and have fathers who are both more hostile and affectionate toward their sons. In young children conscience does not appear a unitary process. For neither sex does emotional reaction to the deviation situation predict the child's self-control when confronted with temptation. Resistance seems more a part of developing ability to behave in socially acceptable ways and especially to control aggressive impulses. Resistance to temptation is in fact strongly negatively related to antisocial aggression in either fantasy or overt behavior (Ferguson, 1970).

Disadvantaged Anglo children under five years of age

Social behaviors.--(Prosocial behaviors). Fours are sensitive to cues for cooperation and competition, and only when cues for cooperation are present do DADV quickly assist each other. They do not differ from ADV in this respect (Nelson and Madsen, 1969).

Motivation.--(Preference). DADV under fives continue longer attend selectively to color rather than beginning to attend to fo (Gotts, 1971a).

Intra-psychic factors.--(Attachment). A principle problem o DADV under fives is that family instability tends to disrupt impo interpersonal object relations. These disruptions have been show be associated with lower levels of both cognitive and affective functioning. The actual sequence of cognitive development is rel ely unaffected by this, but the affective sequence may be drasticall altered, so that the under five who has experienced disruptions attachment will show a deviant pattern of affective development n Decarie, 1965).

Disadvantaged Negro children under five years of age

Social behaviors.--(Dominance). Detrimental behaviors are the strongest predictors of poor school performance. Signs of detrimental behavior are resistance and refusal to cooperate and more covert resistance indicated by non-meaningful responses to tasks (Hess and Others, 1969).

(Maturity). Few inner-city Negro under fives (half from nuclear and half from incomplete families) have set tasks; they are instead called on for small duties. At two and one-half one-third of them have completed toilet training and one-half still drink from the bottle, with mothers evidencing little emotion over this (Wortis and Others, 1963).

(Prosocial behaviors). Negro DADV fours are sensitive to cues for cooperation and competition, and only when cues for cooperation are present do they quickly assist one another. In this they resemble both DADV and ADV Anglos (Nelson and Madsen, 1969).

Social perceptions and communications.--(Perceptions of school). Lower SES Negro mothers of father-absent families agree with questionnaire items forming 1) a factor of frustration, futility, and uselessness of attempting to change the educational system or the unruliness of children; 2) a factor of conservatism of outlook toward education (i.e., preferring work over play); 3) a resignation factor, and 4) an expectancy toward success in school. They agree on the importance of education, but they view themselves vis-a-vis the teacher as passive individuals seeking advice and view the demands of the school primarily in terms of conformity to new routines, of obedience rather than inquiry and exploration, and of teacher authority rather than teacher-child interaction in learning. This outlook seems to support the passive orientation of the DADV child toward MSES institutions (Shipman, 1966).

Motivation.-- (Preference). Fours prefer objects over pictures and color over black and white (Irwin, 1967).

(Higher needs). Among nursery schoolers, curiosity is evidenced as primarily verbal in some, scanning and observing in others, and manipulation of material or exploring sensations in others. Curiosity measures and rankings are consistently interrelated, showing consistency in the child's stance toward environmental stimuli in terms of approach-avoidance. Curiosity is positively related to differentiation and integration of self-image in figure drawings and differentiation of affective expression. High curiosity children also show adults,in doll play as effective and able to solve dilemmas. These children are further more effective at categorizing and classifying (Minuchin, 1969).

Curiosity manifestations during free play are associated with maternal control strategies and teaching behaviors and with children's ability to perform successfully and to avoid detrimental behavior. It is not LSES *per se* that seems to reduce interest in complexity, although father-absence may be associated with aimless behavior (Hess and Others, 1969). In cooperative mother-child work sessions, LLSES mothers give low predictions of success and in father-absent cases spend more time and effort on the task than in father-present cases. Kind and extent of maternal control over the child more powerfully determine performance than do strictly cognitive maternal characteristics (Brophy and Others, 1965).

Intra-psychic factors.--(*Locus of control*). Conduct and academic achievement are differing aspects of educability. Good conduct is closely related to an internal locus of control (i.e., feelings of responsibility for success or failure). Children's ability to conserve also relates to internal locus of control. Mother variables seem to influence cognitive performance more than conduct. An internal locus of control for mothers is associated with children's school success (Hess and Others, 1969).

(*Controls*). School readiness and performance relate to these non-intellectual factors: child's ability to delay gratification, to control motor movement, to reflect before responding, and to minimize errors and non-meaningful responses, although the evidence does not support an underlying factor of impulse control versus impulsivity. Short response times, for example, on a design recall task are seen as signs of alienation from the task rather than impulsivity. Father-absence is associated with incapacity to delay (Hess and Others, 1969).

Social-cultural-familial influences.--(On group gains). The child who does well in school is likely to have a warm, supportive mother who stresses personal-subjective control strategies and avoids imperative commands and status-normative appeals. This mother also uses effective teaching techniques such as orienting the child to the task, giving specific feedback, accompanying directions with rationales, eliciting the child's interest and cooperation, and using praise. Girls' school performance is affected more than boys' by maternal variables. An exception is that mothers' affective behavior (use of imperative control strategies and feelings of anxiety) relate more to boys' school performance (Hess and Others, 1969).

(On general development). Inner-city children are accustomed to extremes of adult authority, being very controlled at times and uncontrolled at others. If the child cannot perform, he is not met with criticism and pressure to do better. He is encouraged to fight for his rights. He learns to work when asked. He may be confused about who has authority over him because many persons with different expectations exercise a parental role. Corporal punishment is typical. Achievement is not praised (Wortis and Others, 1963).

Disadvantaged children under five years of age with unidentified or mixed ethnic background

Social behaviors.--(Family factors). Anglo and Spanish surname ULSES fours who are of high dependency are highly sensitive to changes in nurturance level, experience nurturance withdrawal as stressful, and do more poorly on complex task performance after nurturance withdrawal (Dibartolo and Vinacke, 1969).

(Imitative behavior). When children engage in imitative behavior, it is more likely to be of main television performers from classroom television than of teachers (Mukerji and Others, 1966).

(Social skills). Anglo and Mexican-American threes and fours who have been in a preschool program do not differ from non-program controls in self-direction in socially desirable behavior or socially appropriate interpersonal relationships (Vance, 1968) nor do they show greater initiative (Vance, 1967).

Social perceptions and communications.--(Self-awareness). Inner-city threes who view themselves and peers on television display awareness of peers but not of self (Mukerji and Others, 1966).

Motivation.--(Reward schedules). Case studies in Head Start show that behavior modification procedures work to increase desired behaviors and to decrease maladaptive behaviors when differentiated reinforcement is used and natural classroom contingencies such as play, snacks, teacher attention, and preferred activities are relied upon (Allen, 1970).

(Preference). A preschool enrichment program for DADV Negro and Anglo fours results in increased interest in school-oriented activities by both children and parents (Feldman, 1964).

Intra-psychic factors.--(Personality, global). Four-year-old inner-city boys, 38 percent from father-absent families, show a wide range of play ability. One small group of these children is involved in stage appropriate development, and these are without exception of superior cognitive level. Another small group is seemingly dealing with stage appropriate issues but through them manifesting conflict over earlier stages; they invariably show minimal cognitive differentiation.

The largest group, which manifests concern over current-age developmental issues plus conflicts regarding earlier stages, shows great variability of cognitive-verbal function (Hirsch and Borowitz, 1967).

(Adjustment). Social adjustment is near age norms for children from Head Start (Cawley, 1966).

(Emotionality). Of four-year-old children entering compensatory programs in 1964-1967, only 35 percent were free of symptoms of emotional tension. Rates of occurrence of these manifestations, in percentages, are as follows: for daytime wetting (10.7), reported stuttering at home (14.5), observed stuttering (1.4), thumb sucking (25.3), grinding teeth (11.8), rocking (8.6), head banging (9.2), and crying out during sleep (21.9) (Stine, Saratsiotis, and Furno, 1969).

(Controls). Children receiving the Autotelic Responsive Environment experience show better impulse control, with this improving further during a second year and being higher within a year for older children (Nimnicht and Others, 1967).

(Adaptability to demands). Puerto Rican threes make fewer initial work responses and fewer work responses upon additional request than do MSES children. For performance items on the S-B, they do not differ from MSES; therefore, the differences are most prominent on verbal items, even when examined in Spanish (or English if they favor it). They also make fewer spontaneous verbal extensions of their work. When they do not respond to a demand, they are highly likely to engage in substitutive activity. These differences are not artifacts of IQ, and sex differences are minimal. It appears that they respond as if the situation were a social occasion rather than a test (Hertzig and Others, 1968). Montessori children compared to traditional prekindergarten are more able to settle down, attend, and comply with task procedures (Berger, 1969).

Social-cultural-familial influences.--(On general development). Three parental variables influence the relation between personality and disciplinary behavior: parent's position in the marital relationship, childrearing norms as opposed to direct expression of the motive, and outside opportunities to express the motive (Hoffman, 1963).

Disadvantaged Anglo five-year-old children

Social behaviors.--(Situational factors). Authoritarian and socially-integrative democratic teachers of Anglo kindergarteners differ in method, but this difference does not affect group cohesiveness of children. Instead, apparently sex identity (rather than race identity, Anglo and Negro present) determines subgroup formation (Hirsch, 1968).

(Prosocial behaviors). Among fives of LLSES, 96 percent of boys and 76 percent of girls keep more marbles for themselves than they share with a partner, although much sharing occurs. Boys give more cooperative responses than do girls and Anglos more than Negroes. Apparently children respond to those of a different race in the same way that they do to those of their own race (Wasik, Senn, and Epanchin, 1969).

(Social skills). Among Anglo Head Start children, girls suck thumbs more and show more total appropriate social behavior. Anglo-Negro differences are not apparent, but some sex by race differences appear. Anglo girls are less disturbing and disruptive than Negro girls; Anglo boys have less difficulty interacting with strangers than do Negro girls (Kohlewes, 1967). Anglo fives (LLSES) in a compensatory program improve in social behavior (Diagnostically Based Curriculum, 1969), and adjustment (Hodges and Spicker, 1967).

Social perceptions and communications.--(Status awareness). Head Start fives show little difference resulting from father-absent and father-present status in their perceptions of adult sex roles. Sharp adult male-female role differentiation by children is apparent. Seemingly it is the effects of father-absence on family income, supervision and negative role expectations of unhappy women rather than father-absence *per se* which determines the previously obtained differences between father-absent and father-present children (Aldous, 1969).

(Person preference). Children in a compensatory program become both more liked and less liked than controls, with the former occurrence being more pronounced. It may mean that for better or worse they are more active social participants as a result of their program experience (Hodges and Spicker, 1967).

(Emotional communication). Fives recognize facial expressions of angry and happy with high accuracy, sad with moderately high accuracy, and afraid at nearly chance (Dil, 1969).

Motivation.--(Preference). DADV fives have an elevated preference for color over form as a basis for judging similarity of objects (Gotts, 1968b). Children who prefer form over color have higher success in the first half year of reading. Those who prefer color show greater reading readiness than those who have no clear preference for color or form or size (Pearson and Gotts, 1970). When form is not a possible choice, form-preferring children evidence conflict by making more errors, taking longer to respond, and verbalizing their effort to find similarity of form (Miller, D. R., 1969). DADV Anglos decrease their color preference and increase form preference during a one-year Head Start program. They initially prefer form more than do Indians and Negroes (Spellman, 1967).

(Types of reward). Anglo poor are highly motivated by candy reward in comparison to other selected rewards. They will stay and work when tasks are interesting and they can succeed (Stern, 1966).

Intra-psychic factors.--(Adjustment). Individual differences in response to reinforcement are not related to conduct problems versus personality disorders, contrary to an earlier finding (Bommarito, 1968), i.e., adjusted children are not more responsive to adult influence. Head Start children show a very substantial initial advantage over non-Head Start children in adjustment. But after three months of kindergarten, the other children are also adjusted, so the difference disappears (Wolff and Stein, 1967).

(Activity level). Boys are more hyperactive than girls in Head Start. Anglo boys are less lethargic or apathetic and display more energy than Negro girls (Kohlewes, 1967).

Disadvantaged Negro five-year-old children

Social behaviors.--(Resistance to temptation). Sex differences among father-absent and father-present fives are not evident in resistance. Boys from these two groups do not differ. Father-absent children of either sex resist more the temptation to cheat with a male rule giver, but those from father-present homes resist more with a cross-sex rule giver (Mumbauer, 1969).

(*Transgression*). Stutterers and maladaptive non-stutterers in Head Start do not differ in defensiveness, but the stutterers evidence more repression-denial and symbolization than do adaptive non-stutterers (Porterfield, 1969).

(*Prosocial behaviors*). Negro fives are more cooperative when cooperation is reciprocated than are Mexican-Americans, but when it is not reciprocated, they are not different (Manning and Buntaine, 1969). Male fives respond cooperatively more than do females, but more males keep more of a commodity for themselves than do females. Negroes give fewer cooperative responses than Anglos, but neither social group cooperates differentially on the basis of race (Wasik, Senn, and Epanchin, 1969). Negro boys from a welfare center are slower to acquire sharing behavior than are Negro girls or MSES children (Doland and Adelberg, 1967).

(*Social skills*). Girls in Head Start show more appropriate social behavior than boys. Negro girls are more disturbing and disruptive than Anglo girls, and they have greater difficulty interacting with strangers than do Anglo boys (Kohlewes, 1967). Social growth is greater for dependability, cooperation, and independence in a nine-month than in a summer Head Start program (Pitts, 1967).

Social perceptions and communications.--(*Status awareness*). Father absence versus father presence *per se* is less a source of difference in adult sex-role perceptions than are the effects of father absence upon family income, supervision, and negative role expectations by mothers. Male-female adult role separation is distinct. The only differences among Negro and Anglo children center about the Negro girls' apparent early preparation to feel comfortable in the role of head of household (Aldous, 1969). Negroes show negative connotations for the color black as a descriptor of objects, although less consistently than do Anglos (Stabler and Others, 1969).

Motivation.--(Threat). Negro children give more verbal devaluation of a favored but forbidden toy under harsh than under mild threat. This is a reversal of MSES Anglo reactions (Oftfeld and Katz, 1969).

(Reward schedules). Delay of gratification relates positively to WISC IQ among kindergarteners. Twenty percent of Negro DADV choose to delay for a larger prize, while 48 percent choose a lesser prize immediately, the balance alternating by task. These rates show lower delay than among ADV (Zimiles, 1967).

(Preference). Negro Head Start children have a high rate of color preference and a low rate of form preference but shift dramatically toward form preference during Head Start (Spellman, 1967). Form preference favors success in reading among DADV Negroes (Pearson and Gotts, 1970).

(Types of reward). For Negro poor candy has little reward appeal, with four conditions substantially outranking it, including no reward or punishment (Stern, 1966).

Intra-psychic factors.--(Self concept). Self concept improves among Negro Head Start children, particularly in central city centers and in the Southeast (Westinghouse Learning Corporation, 1969).

(Adjustment). Three of every four psychiatric referrals from Head Start are boys. Moderate to severe mental retardation is present in perhaps two-thirds of the referrals, with about one-half showing moderate to severe personality problems. Severe malnutrition and maternal deprivation are the common stresses (Comly and Hadjisky, 1967).

(Activity level). Negro Head Start children are more passive in the home than in the school setting. Negro mother-child dyads are one-half as active as are Puerto Ricans in verbal and non-verbal communications that encourage exploration and learning. Negroes are more active in use of verbal admonitions and "don't" in critical comments. The pattern of passivity, however, seems readily modifiable or reversible under changing conditions (Weissman, 1967). Negro girls are more lethargic or apathetic and display less energy or drive than Anglo boys (Kohlewes, 1967), which is partly so because boys generally are more hyperactive than girls.

Social-cultural-familial factors.--(On general development). At five there is much restrictiveness of Negro mothers toward aggression against parents and toward sex play (Wortis and Others, 1963).

Disadvantaged five-year-old children with unidentified or mixed ethnic background

Social behaviors.--(Aggression). Among Head Start children overt aggression is unrelated to fantasy aggression (Dorman, 1967).

(Dominance). Head Start children's instrumental assertion, determined from observer ratings, agrees with performance of a task requiring children to knock over a tower of glass tumblers to retrieve a toy, showing some generality for assertion. More assertive children show higher passing rates on selected S-B items (Dorman and Rebelsky, 1969).

(Situational factors). When Head Start children are in a strange or novel environment, the presence of a peer-friend promotes security and positive affective states and produces more verbal communication than occurs in a peer-stranger condition, while gazing behavior is more variable with a peer-stranger than with a peer-friend (Schwarz, 1968). The relatively high dependency of urban DADV children on siblings (Hillery, Lingren, and Remstad, 1969) may be related to the foregoing observation.

(*Family factors*). Attitudes of Head Start mothers seem to vary along the same dimensions as do those of MSES mothers (Yater, Olivier, and Barclay, 1968).

(*Prosocial behaviors*). Mexican-American boys give the same amount of cooperative behavior as Negroes when cooperation is not reciprocated, but they show less than Negroes when cooperation is reciprocated (Manning and Buntaine, 1969).

(*Social skills*). Children in summer Head Start become more cooperative and novelty-seeking and improve in general adaptation (Chorost and Others, 1967).

Motivation.--(*Threat*). Mixed Negro and Anglo DADV children verbally devaluate a forbidden toy more following harsh than mild threat, a trend opposite that for ADV children (Oftfeld and Katz, 1969).

(*Failure/success*). A picture-word association learning task which immediately follows either success or failure or neutral activity seems unaffected by the preceding conditions among Head Start children. Also, differences in performance following failure are not attributable to the child's locus of control (Bauman, 1969).

(*Reward schedules*). Verbal reinforcement increases object-related statements of inner-city kindergarteners (Sigel, Ireland, and Watson, 1967). Imperfect application of reinforcement principles in experimental classes can lead to largely restrictive, non-supportive classroom atmospheres, resulting in children's decreased task involvement and decreased attending to teacher together with increases in disruptive behavior (Katz, 1969).

(Stimulus variation). Head Start children play longer with novel toys which make loud noises and less with familiar toys from their classroom when they are placed in an unfamiliar room (Schwarz, 1968).

(Preference). Presence of a friend or an unfamiliar peer exerts no differential influence upon toy preference. Head Start boys, for example, fire a gun three times as often as girls whether a friend or stranger is present, although children who are alone fire a gun less (Schwarz, 1968). Indians prefer color over form but increase in form preference during a one-year Head Start program (Spellman, 1967).

(Types of reward). Head Start children learn a discrimination better under social or tangible reward than under no reward, with the rewards not differing from each other in effectiveness. DADV children may, however, learn more under tangible reward with more difficult tasks (Unikel, 1968).

(Higher needs). Mexican-American and Negro Head Start children who have MSES mothers teach them during a summer program increase in achievement motivation (Pierce-Jones, 1968b).

(Teacher effects). Head Start teachers classified as excellent, satisfactory, weak or unsatisfactory on the Minnesota Teacher Attitude Inventory have children who make the most through the least gains in the same descending order (Riley and Epps, 1967).

Intra-psychic factors.--(Self concept). The physical attractiveness of Head Start children increases, apparently as a result of program emphasis on self concept and parental interest (Krider and Petsche, 1967). Spanish surname plus Negro children, when asked before Head Start to indicate body parts, point to themselves 36 percent of the time and to a doll the remainder of the time. This increases to 59 percent self-pointing after the children have been the charges of MSES mothers through the summer. Control subjects show even larger percentage gains in self-pointing. Self-drawings of the experimental groups, however, improve more than those of controls (Pierce-Jones, 1968a). Self-concept has been explicitly excluded from some studies because of the belief that it cannot yet be measured reliably (Nimnicht, Rayder, and Tuck, 1970).

(Adjustment). Apparent social adjustment gains of Head Start children result sometimes from failure to control for CA and IQ effects (Krider and Petsche, 1967). Head Start participation improves children's emotional stability and task-oriented interactions with adults and increases work orientation (Hooper and Marshall, 1968). Puerto Rican children make greater kindergarten adjustment if they have been in Head Start, although the advantage is short term since after three months non-Head Start children reach approximately the same point (Wolff and Stein, 1967). Adjustment to first grade also is positively related to prior educational program experiences (in kindergarten) (Hammond and Skipper, 1962).

(Activity level). Head Start, Puerto Rican mother-child pairs are more active in the home than in the school setting and twice as active as Negro pairs in verbal and non-verbal forms of communication that encourage exploratory behavior and learning. Puerto Ricans are also higher in activity rates for "teaching," reinforcement, smiles, and touch contacts (Weissman, 1967).

Social-cultural-familial influences.--(On program gains). Puerto Rican and Negro parents of Head Start-eligible children who do not attend have slightly higher income than those whose children attend, although 60 percent of the former group's children do not attend simply because families learn of the opportunity too late or not at all (Wolff and Stein, 1966).

Children who do well at the end of Head Start have parents who are critical of the program (Chorost and Others, 1967).

Disadvantaged Anglo children, mixed ages

Social behaviors.--(Family factors). Head Start mothers provide less social reinforcement for their children's activities than MSES, often showing authoritarian interventions. These mother-child dyads also have fewer affection-based interactions (Kagan and Wimberger, 1967). Lower SES mothers who are led to believe that their child is unstructured, immature or unimaginative provide substantially less directing, help, structuring and helping than MSES mothers (Walters, Connor, and Zunich, 1964).

(Prosocial behaviors). Negro first, Mexican-American second, and Anglo girls third, show this ranking in amount of trusting, cooperative behavior. Girls give more intra-group than extra-group trust and cooperation, while boys do not differ in this (Manning, Pierce-Jones, and Parelman, 1968).

Intra-psychic factors.--(Creativity). Anglo DADV children are less divergent thinkers than ADV, and lower IQ Anglos more so than higher IQ (Savoca, 1965).

(Controls). Anglo DADV are more impulsive than reflective when contrasted with ADV Anglos (Mumbauer and Miller, 1969).

Disadvantaged Negro children, mixed ages

Social behaviors.--(Sex-typing). Negro LLSES (ages 4-5 through 5-11) girls do not differ in sex-typing, aggression or dependency as a function of father absence (FA) or father presence (FP). FA boys with a father substitute are less dependent than FA boys with none. FA children's behavior is affected by sex-composition of their older-sibling group, with older brothers being associated with more masculine characteristics in boys and girls and older sisters with more feminine in both (Santrock, 1970).

(Prosocial behaviors). Negro Head Start girls are more trusting and cooperative than Anglos and slightly more so than Mexican-Americans, although girls' intra-group exceeds their extra-group manifestation of these behaviors (Manning, Pierce-Jones, and Parelman, 1968).

Motivation.--(Reward schedules). Intermittent teacher approval or correction of descriptive adjective usage has little or no effect. Continuous teacher reinforcement for 50 days more than triples the group rate of color adjective usage. Making a snack or materials available contingent on color usage increases the level in an unprecedented manner. Natural contingencies seem to maintain the level of such behavior once it is established (Hart and Risley, 1968).

Intra-psychic factors.--(Creativity). Negro DADV children are less divergent thinkers than ADV Negro, and higher IQ Negroes more so than lower IQ Negroes (Savoca, 1965).

(Self concept). Children in the DARCEE project show higher happiness and greater satisfaction in self concept score than do controls (Klaus and Gray, 1968).

(Controls). Delay of gratification is unaffected by DARCEE participation, but participants become more reflective than controls (Klaus and Gray, 1968).

Disadvantaged children with unidentified or mixed ethnic background, mixed ages

Social behaviors.--(*Maturity*). Head Start children are on the average socially two-tenths of one year ahead of their CA (4.5 to 6.9). The relation of MA and social maturity is quite small ($r=.27$) (Norton, 1969).

(*Sex-typing*). Among Negro and other children (3-0 through 6-11) of LSES background, human figure drawing is not sex differentiated 50 percent of the time, is sex differentiated 24 percent, and is unrecognizable 26 percent of the time. Differentiated drawings increase from 1 percent at three years to 46 percent at six. Girls draw more differentiated figures than do boys. Same-sex figures are produced more than opposite-sex figures by all age and sex subgroups, but the differential is not substantial among older girls (5-6 to 6-11). More older girls draw same sex with a female examiner present (Datta and Drake, 1968).

(*Prosocial behaviors*). Three- through five-year-old DADV girls acquire least and boys most cooperative behavior under reinforcement, with higher SES children falling at intermediate positions (Brotsky and Thomas, 1967).

(*Conformity*). In situations where role expectations are clear, where there is consensus among teachers, and where role prescriptions are readily enforceable, both normal and problem children (ages 2.5 through 5) from single-parent homes show a high degree of adjustment (Kitano, 1962).

(*Social skills*). Spanish surname DADV children in a Montessori Head Start program gain more on social-emotional development than do Anglos, although both exceed their initial standings (Johnson, 1965).

Social communications and perceptions.--(Status awareness). School experience accelerates ability of Mexican-American fours and fives to discriminate and make evaluations regarding skin color. Awareness of skin color seems to increase with exposure to school but not with age increases (Werner and Evans, 1968).

(Self awareness). Mexican-American fours and fives best like and judge white dolls to be "most like me" after exposure to school (Werner and Evans, 1968).

Motivation.--(Reward schedules). Among severely retarded children with social age of 31 months but CA eight to ten years, intermittent token reinforcement for behaviors incompatible with their maladaptive behaviors and removal of tokens for maladaptive behaviors result in decrement of maladaptive behavior, particularly of aggression toward peers (Perline and Levinsky, 1968).

(Stimulus variation). Starting speed for lever pulling is slower following a novel stimulus than a familiar stimulus light, but after further presentations, these are not different. This stimulus familiarization effect reflects habituation (Witte, 1967).

(Types of reward). Mixed Negroes and Anglos (49 to 69 months) show poorer discrimination learning under candy reward than under punishment or reward-punishment combination (Spence and Dunton, 1967).

Intra-psychic factors.--(Self concept). Children (3 through 5 years) of disorganized LSES families often use their bodies for diffuse discharge and avoidance; have little confidence in themselves or their abilities; frequently engage in self-depreciation; express self-expectations of failure; are confused about who they are; and show only low levels of enjoyment (Pavenstedt and Others, 1967).

(*Controls*). Short-term pre-kindergarten intervention reduces impulsivity in drawing and walking more for children whose initial performance is better (Hayweiser, Massari, and Meyer, 1968).

(*Fantasy*). Children of disorganized DADV families show unusually poor demarcation between reality and fantasy. Initially most do not seem to know how to play (Pavenstedt and Others, 1967).

(*Adaptability to demands*). Children of disorganized families manifest pervasive passivity as their main coping response. They act upon cues or in direct imitation of others rather than on their own volition. For them the most difficult of school routines are transitions. Auditory and particularly visual hyperalertness with excessive focusing on the actions of adults exist alongside their striking unresponsiveness to and lack of curiosity about large segments of the external world. Expectations of calamity and guarded fearfulness permeate all aspects of coping. Their characteristic relationships with people are need-oriented, distrustful, shallow, and nonspecific. To be in contact with an adult overrides everything else (Pavenstedt and Others, 1967).

Social-cultural-familial influences.--(*On program gains*). Mexican-American children who have been in a preschool program show, by late primary grades, positive relations between reading achievement and environmental achievement press (.61), activeness of family (.54), identification of models (.38), range of social interaction (.39), perceived value of education (.39), home intellectuality (.35), and family work habits (.27) (Henderson, 1969).

(*On general development*). Children of disorganized families, after two years in nursery school, increase their range of facial expression, abuse their bodies minimally, show progress in development of self esteem, are reasonably cooperative and not blindly obedient, are more flexible, react in a more purposeful manner to reduce stress, show more age-appropriate reality-fantasy limits, increase in capacity to relate to the teacher, develop peer relationships, and begin to enjoy play. They continue to be hyperalert, express unsatisfied needs, find it difficult to fight for their rights, and still tend toward inflexibility (Pavenstedt and Others, 1967).

Anglo children of undesignated or mixed socioeconomic background, under five years of age

Social behaviors.--(*Introversion*). Shyness at three years is negatively related to verbal intelligence at five years (Bayley, 1968).

Social perceptions and communications.--(*Social abstraction*). Understanding of *bad* comes into focus around age two and increases in power thereafter. *Good* is understood by three to four years (Rhine, Hill, and Wandruff, 1967).

(*Person preference*). Same-sex play and same-ethnicity play are greater at mean age four and one-half years, but the latter cleavage does not seem to indicate prejudice of Anglos against Hawaiians or vice versa (McCandless and Hoyt, 1961).

Intra-psychic factors.--(*Self concept*). Direct self assessment seems feasible with fours. They are not too egocentric to engage in self criticism, although they generally tend to overevaluate themselves. Accuracy of self appraisal does increase with MA and CA. Accuracy is inversely related to need for defensiveness (Weiner, 1964).

(*Personality, global*). Body type hypotheses for boys (ages 2 through 4) are seldom significant, but for girls they are supported. Endomorphic girls are more cooperative, cheerful, low in tenseness and anxiety, and socially extroverted. Mesomorphic girls are energetic. Ectomorphic girls are uncooperative, not cheerful, anxious and aloof (Walker, 1963).

(Activity level). Boys who are active and rapid at three years have higher mental ability later. At about three years both girls' and boys' rapidity and activity become related to later verbal intelligence throughout their life spans, except for a brief period around five years of age when the relationship is negative (Bayley, 1968).

(Emotionality). Boys who are happy, calm and positively responding at three years are likely to have above average IQ's at five and later. This relation is temporarily depressed around five years. For girls, positive behavior increases at five years but is unpredictable thereafter. Happiness shows the same course over time for both sexes, as does positive behavior (Bayley, 1968).

(Reactivity). Calmness in boys at three years is positively related to verbal IQ at five years and steadily so over later life. The relationship for girls is positive at five years but is later unpredictable (Bayley, 1968).

(Fantasy). Children's stories depict a pervasive thematic use of violence followed by friendly themes, those dealing with food and eating, and those dealing with harm coming to people. Girls more than boys mention people; boys mention vehicles more often. Boys mention more males than females at all ages (2 to 5 years); at two and three, girls mention more girl than boy characters but thereafter more males at every age. Mothers are depicted in more positive roles by girls at younger ages, but not after three and one-half, and by boys at all ages. Fathers are seen as more positive than negative except by boys at three and one-half and by both sexes at four and one-half (Ames, 1966).

(Attachment). High responsiveness to persons at three years is strongly positively related to verbal IQ for boys at five years but not for girls (Bayley, 1968).

Social-cultural-familial influences.--(On general development). Warm and understanding maternal behaviors versus punitive rejection more profoundly affect boys than girls. For both sexes, however, maternal hostility is negatively related to full-scale intelligence (Wechsler) later in life, whereas loving behaviors are positively related to later IQ, these effects being stronger for boys. Maternal controlling behaviors show variously mixed relations for boys, but for girls they are generally related negatively to later IQ (Bayley, 1968).

Negro children of undesignated or mixed socioeconomic background, under five years of age

No studies.

Children of undesignated or mixed socioeconomic background, under five years of age

Social behaviors.--(Aggression). For under fives, affiliation arousal counteracts the usual tendency for aggressive doll play. Parental permissiveness toward aggression is associated with low doll play aggression only among girls who are physically punished; daughters of strict, physically punishing mothers are more aggressive. Boys may respond to maternal strictness by inhibiting aggression to lessen threat of loss of love, while girls respond with modeling behavior (Gordon and Smith, 1965). At age four, a smaller number of boys exhibit the same overall number of aggressive behaviors in doll play as do a larger number of boys at six.

They exceed girls in aggression at age four, with a given number of boys surpassing about an equal number of girls in aggressive responses made (Moore and Ucko, 1961).

Aggression by nursery schoolers in play therapy seems to satiate molar aggression (Saunders, 1961). Under-five psychotic children, who are placed in group therapy, begin to disrupt each other's solo behavior. As these disruptions become more frequent, the interrupted child fights the interrupter aggressively. This later shifts into less attack and more mutual observing behavior. The child who continues to aggress finds the group spontaneously ganging up against him. Since all children alternately take the aggressor role, they soon gain respect for the retaliatory powers of the group (Speers and Lansing, 1969). Among fours, aggression follows viewing an aggressive film when the child has not been frustrated. The child who is frustrated before viewing an aggressive model tends to inhibit aggression (Kuhn, Madsen, and Becker, 1967).

(Dominance). Ascendant behavior is lower among threes than fours or fives. Preschool children exhibit more verbal than motor behavior and more socially acceptable than socially unacceptable behavior (Frazier, 1964).

(Situational factors). Public health nurses and volunteers are able to shape behavior toward more mature play among threes and fours in a waiting room by attending or withholding attention systematically (Wootton, Wood, and Barnes, 1970).

(Family factors). Boys around three years from larger families manifest more contact with a female teacher. Maternal initiation of contact with the child is less as family size increases (Waldrop and Bell, 1964). Parents who have experienced parental deprivation in childhood are more likely to have under fives with behavior disorders, across SES levels (Wolff, 1961a).

(Imitative behavior). Imitative behavior of nursery schoolers is increased more by reinforcement but also by interaction with an adult during story telling. Imitative behavior extinguishes rapidly when reinforcement is withdrawn for either of these conditions (Zahn and Yarrow, 1968). Fours who watch a ten-year-old filmed model play with particular toys show large model effects and lesser enhancement effects if the model plays with toys different from those which the child has available. (Parton and Dubanoski, 1969). Reinforced model aggression influences the performance of threes and fours (Bandura, Ross, and Ross, 1963) but not their acquisition of aggressive responses (Bandura, 1965). Nursery school girls imitate more than boys, especially for a female model. When behavior is sex-inappropriate or not typed, imitation may not be differentially displayed for models of differing sex (Fryrear and Thelen, 1969).

(Resistance to temptation). Four-year-old girls appear to resist temptation according to an escape or avoidance learning paradigm, resisting more under nurturance withdrawal than under nurturance, whereas sixes do so to secure positive reinforcement from teachers (Saadatmand, Jensen, and Price, 1970). Children who have broken a rule to solve a difficult maze subsequently are more lenient concerning outcomes of a story concerning rule infraction, while rule conformers are more punitive (Ross and Ross, 1969).

(Dependency). Fours reinforced for competency in puzzle completion give more competent responses than do children reinforced for dependency or alternately reinforced for dependency and competency. Subjects reinforced for the other two kinds of behavior become bored and emit task-irrelevant, novelty-seeking behaviors (Speer, Briggs, and Gavalas, 1969).

Dependent responses of the being near and contact seeking variety are more common among anxious under fives, but attention seeking is not. Dependency responses toward strangers is lower than toward mothers. Proximity seeking is a more primitive form and attention seeking a more mature form of dependency (Rosenthal, 1967).

(Transgression). Among fours, leniency toward transgression appears to be a coping behavior to reduce anxiety associated with one's own transgression (Ross and Ross, 1969).

(Maturity). From 12 to 60 months, children travel increased distances from their mothers, stay away longer and leave more frequently. Sex differences are absent (Rheingold and Eckerman, 1970). Montessori fours are more independent, less in need of the teacher, and evidence more leadership than non-Montessori peers (Fleege, Black and Rackaaskas, 1967).

(Sex-typing). Identification with the parent affects responsiveness to parental control techniques; boys respond to maternal strictness by inhibiting aggression to lessen threat of loss of love; girls respond with modeling behavior (Gordon and Smith, 1965). Girls fairly consistently more than boys choose mothers who are depicted in drawings as caregivers and as companions (Landreth, 1963). Four-year-old girls are more feminine than threes on IT Scale, but boys are not differentiated by age (Hartup and Zook, 1960). Older under-fives more accurately perceive the sex-typed character of objects, especially female-typed objects, with boys and girls equally accurate. Boys do not choose a majority of same-sex-typed objects preferentially until they are four (Vener and Snyder, 1966). In nursery school, girls imitate a female model more than a male, but boys do not differentially imitate; it is the sex-typed quality of the model's behavior which seems to differentiate the modeling of it (Fryrear and Thelen, 1969).

(Prosocial behaviors). Interruptions of another child's play activity by a psychotic child, during group therapy, are not accidental but are attempts to make contact with the other child. Eventually group formation develops, in fact, out of transactions initiated in this way (Speers and Lansing, 1969). Constructive responses comprise a majority in the doll play of fours, increasing with age and being greater for girls than boys (Moore and Ucko, 1961).

(Conformity). Girls are more conforming to parents than are boys, with age differences not apparent in the range three through five (Starkweather, 1967).

(Social skills). Gradual induction of twos and threes into church nurseries with support of mother results in higher adjustment and more adaptive behavior than the usual sudden induction. Threes benefit, but less than twos. Girls adjust better than boys (Towne, 1960). Two-day per week nursery school attendance by threes results in less social communication, self-reliance, and imitation than do three-day or five-day programs. The latter is the most beneficial to general social progress (Weisdorf, 1965).

Social perceptions and communications.--(Social abstraction). Internal consistency of social desirability responding is low among threes and higher among fours, with reliability coefficients likewise increasing with age. Number of socially desirable responses goes up with age and is higher for girls (Cruse, 1966).

(Person preference). Peer acceptance and peer rejection are unrelated among fours. Giving positive reinforcement to peers is related (r=.67) to social acceptance but not to rejection. Giving negative reinforcement is related to social rejection (r=.73). Giving positive reinforcement is actually preponderant in peer interactions, such that children receive more positive than negative reinforcement even from disliked peers (Hartup, Glazer, and Charlesworth, 1967). Among threes and fours, children of both sexes give more positive choices to same-sex peers and more negative choices to opposite-sex peers. Dependency on adults relates negatively to popularity, but the child's tendency to seek attention, reassurance and help from older children does not interfere with popularity and may facilitate it (Moore and Updegraff, 1964).

(*Affective awareness*). French and American threes and fours recognize with high accuracy photos depicting emotions at age three, increasing accuracy further at each year until nearly perfect at age nine (Izard, 1968).

Motivation.--(*Threat*). Under mild threat fours decrease their liking of a forbidden toy but under strong threat tend to increase their evaluation (Turner and Wright, 1965).

(*Reward schedules*). Threes and fours imitate a model rewarded for his behavior more than one punished or than one given access to rewards not contingent on his behavior (Bandura, Ross, and Ross, 1963). Children receiving reinforcement on a 50 percent schedule pull a lever more rapidly than those on a 100 percent schedule (Ryan and Cantor, 1962).

(*Stimulus variation*). In boys, precocious development of fear of novelty is continuously predictive of heightened fearfulness from infancy into early childhood. This is not so for girls (Bronson, 1970).

(*Preference*). Montessori fours gain more in positive attitude toward learning than non-Montessori (Fleege, Black, and Rackaaskas, 1967). Threes with moderate consistency prefer pictures with light units to bright saturated colors, prefer dark shades to bright saturated colors, prefer photographs to black and white drawings, modified realistic drawings to fanciful drawings, and illustrations with more colors to those with fewer colors (Amsden, 1960). Four-year-old boys show interest in the phenomena of the physical world, but girls are not preoccupied with issues of the social world. Boys are more likely to elicit from teachers leading questions about the social world, while girls are offered assistance with this content. Boys's persistence in pursuing their initial questions about the physical is stronger than that of girls for the social world (Haupt, 1966).

(Types of reward). Neither a penny nor verbal reinforcement helps fours learn a difficult oddity problem (Croll, 1970). Four and one-half year olds outperform threes on size transposition problems for which they receive marbles which may be exchanged for toys (Caron, 1966).

(Higher needs). Children from two and one-half through four show negative relations between their need pattern or recognition status and their father's. Love and affection need value to not relate to parents'. No mother-child need value relations are found. Expectancies of children are generally positively related to those of parents (Tyler, Tyler, and Rafferty, 1966).

Intra-psychic factors.--(Behavioral pathology). Behavioral pathology in threes and fours seems unrelated to SES. Behavior pathology occurs in children whose parents have suffered parental deprivation during their own childhoods (Wolff, 1961a).

(Self concept). Psychotic children, as they begin to show greater comfort in group therapty, use a mirror to observe others. Initially they do not regard themselves, although this also develops later. When anxious, these children dash to the mirror and study their image--this appears to control "disintegrative panic." After about one and one-half years of group therapy they develop considerable separation-individuation (Speers and Lansing, 1969). The presence of a distinct phantom limb in a three-year-old amputee suggests that body-image is sharply delineated by that age in at least some children (Easson, 1961). At about 46 months, children begin to include a mouth more systematically in figure drawings than do younger children. By 36 months eyes and body are about as differentiated as they will be by the fifth birthday (Shapiro and Stine, 1965).

(Personality, global). Fours' manifest behaviors cluster into factors interpretable as inherent leadership ability, aggressive domination, individualistic self-sufficiency, and socially irresponsible impulsiveness (Stott, 1959). Further and more extensive work along these same lines reveals 14 separate factors at age four (Stott, 1962).

(Adjustment). Threes are rounded, balanced, relatively conforming, beginning to share, in interpersonal equilibrium, and less ritualistic than younger children. Three and one-halfs show inwardizing of external impressions and experiences. This is accompanied by emotional swings, insecurity, and some motor incoordination. Children often have exaggerated tensional outlets at this age and demand excessive attention. Fours are expansive or out of bounds, boisterous, emotionally intense, pressing the limits. Four and one-halfs are inwardized-outwardized and troubled, but becoming better organized (Ilg and Ames, 1955). Among English children who are referred to a children's clinic at from two through four years of age, nearly half are presented with complaints of badness or unmanageability. The commonest symptoms on admission are, in order, temper tantrums, specific fears, enuresis, and encopresis. Symptomatology on admission does not generally differ from that found at this age in children never referred. Boys are assessed as more disturbed on all measures (Wolff, 1961b). Asphyxiated boys manifest a lower level of adjustment to school than non-asphyxiated (Ucko, 1965).

(Emotionality). At three years, visual fears predominate, while auditory fears are prominent at four, although fear of the dark, wild animals, and parental desertion is present at both ages (Ilg and Ames, 1955). Anxiety level among threes and fours has more effect upon seeking physical contact and being near than on attention seeking (Rosenthal, 1967). In doll play boys exceed girls in anxiety at four and reveal a positive relation between anxiety and aggression. For girls, anxiety is more often associated with failure to respond. Anxiety is also manifest with some frequency in conjunction with punitive doll-play behavior (Moore and Ucko, 1961). Among psychotic children, initial approach behavior by other children increases withdrawal. With repetition of this approach situation, panic-like reactions occur with crying, screaming, shaking, facial contortions, and flailing about. After some group formation appears, rhythmical activity serves to discharge tensions. The children eventually help new group members to cope with their panic reactions (Speers and Lansing, 1969).

For fours who are admitted to a general hospital situational doll play does not affect total stress reaction but causes a decrease in anxiety-defense, with the focus of stress increasing for doctors and medical procedures (Lockwood, 1970). Intensity of reaction of threes to maternal separation is affected by length of separation, strangeness of the hospital environment, and strength of relationship to mother (Bowlby, 1969). Young children whose parents undergo divorce experience this as a major emotional crisis, to which boys seem more vulnerable than girls (McDermott, 1967).

(Reactivity). Fear of novelty during infancy is predictive of the same behavior into early childhood for boys but not for girls (Bronson, 1970). Asphyxiated boys are often more difficult or very difficult children, with degree of asphyxiation positively related to degree of difficulty of the child. Asphyxiated boys particularly are highly reactive to new experiences. They also manifest a high rate of sleep disturbance (Ucko, 1965).

(Controls). The words fast and slow do not exert stylistic control over behavior of fours (Lovaas, 1964). Responding to differing colored lights as cues for either engaging in or inhibiting a motor response reaches 59 percent correct among under fives. Once the child has verbal control, he can in one trial respond in this task to meaning reversals of cues (Beiswenger, 1968). Among childhood poisoning victims (33-43 months) who are rescued, the essential establishment of an inner system of avoidance appears underdeveloped or delayed (Lewis and Others, 1966).

(Fantasy). Dreams begin to appear around three years or a little earlier. Threes sometimes wake up but are not usually distressed. Three and one-halfs dream more and many show distress but are readily quieted. Dreaming by fours may diminish, but four and one-halfs dream more often, with greater disturbance (Ilg and Ames, 1955). Death is a frequent theme in fours' play; most ask questions about death; some evidence concern about death of self or parent (Fredlund, 1970).

(Attachment). Maternal separation in under fours is accompanied in sequence by three reactions: protest, despair, detachment. Reactions are intense, especially where maternal attachment is strong. Attachment in this early form begins to weaken at around three years (Bowlby, 1969).

Social-cultural-familial influences.--(On program gains). Threes--whose mother-child warmth is adequate and whose mother availability is well-defined, for whom new relationships are encouraged, limits set on behavior, and achievement encouraged--demonstrate more stable personality and a superior approach to task performance (Heinicke, 1968).

(On general development). Regressive behavior is frequent among threes and fours whose parents divorce (McDermott, 1967).

Anglo five-year-old children of undesignated or mixed socioeconomic background

Social behaviors.--(Sex-typing). Sex-role preferences are established for both sexes before age five; sex-role identification occurs earlier for girls. Role preference precedes role adoption, and role adoption and identification occur concurrently among girls but in sequence among boys (Ward, 1969).

Social perceptions and communications.--(Self awareness). Among Anglo kindergarteners, 94 percent identify themselves with dolls of their own race compared to 64 percent of Negroes. Anglos tend to assign positive roles to Anglos and negative to Negroes; Negroes make no differentiation in their role assignments. These findings hold in both integrated and non-integrated programs. Boys and girls show the same pattern (Larson, 1969).

(Social abstraction). Although the terms good and bad are acquired before five, they are not well acquired until about six years (Rhine, Hill, and Wandruff, 1967).

Motivation.--(Reward schedules). Anglo kindergarteners learn faster under immediate verbal reinforcement than delayed material reward, across SES levels (Marshall, H. H., 1969), with delayed verbal reinforcement being detrimental to LSES children.

(Types of reward). Material reward acts as a distractor and thus interferes with learning (Marshall, H. H., 1969).

Intra-psychic factors.--(Self concept). Kindergarteners' self-perceptual data largely fit into a single factor identified as "being enough." The relation between these self reports and teacher ratings is low. Children report themselves as feeling less adequate in first grade than in kindergarten. Significant predictions to general criteria a year later are possible from kindergarten data. Self-concept is already differentiated at this age into various competency components (Combs and Soper, 1967).

(Personality, global). Overt behavior of Anglo kindergarten boys falls into seven factors: distractibility, nervous energy, verbal participation, physical fatigue, focused participation, oral satisfaction, and meddlesomeness. Over 99 percent of the variety of contributing overt behaviors are detectable in a sixty-minute period and do not change drastically from day to day (Moreno, 1968).

(Controls). Kindergarteners' verbal control over the starting and stopping of motor behaviors is equivalent to that of first graders when overt self-verbalizations are made, but covert self-verbalization has little effect upon kindergarteners, whereas first graders do better with it than with overt verbalizations (Meichenbaum and Goodman, 1969).

Negro five-year-old children of undesignated or mixed socioeconomic background

Social behaviors.--(Self awareness). Negro kindergarteners identify themselves with Negro dolls 64 percent of the time compared to Anglo identification with Anglo dolls 94 percent. Negroes do not differentiate between Anglo and Negro dolls in their role assignments, whereas Anglos assign more positive roles to Anglo and negative to Negro dolls. Positive and negative role assignments are unrelated to proper self identification by Negroes. Self identification by race is unrelated to the skin lightness or darkness of Negro children (Larson, 1969).

Social-cultural-familial influences.--(On general development). LSES men tend to punish more severely those behaviors defined as antisocial and annoying. Female differences, however, are not evident across SES levels. Fathers of LSES and MSES do not differ in terms of morally intrinsic caring by MSES standards (Hervey, 1968).

Five-year-old children of undesignated or mixed socioeconomic background, mixed ethnic background

Social behaviors.--(Aggression). Boys at six make more aggressive doll play responses than do girls. Overall aggression is the same at six as at four for boys, but a larger number of boys engaging in lesser amounts constitutes the basis for the constant level. About as many girls aggress at six as at four, but in larger quantity at six (Moore and Ucko, 1961). Affiliation arousal does not attenuate aggression in sixes whereas it does in under fives (Gordon and Smith, 1965). More controlled, verbal and indirect forms of aggression are replacing diffuse physical aggression at five (Ferguson, 1970).

(Dominance). Fives demonstrate more ascendant behavior than do threes. This appears independently of sex or SES (Frazier, 1964).

(Resistance to temptation). Girls of six, exposed to temptation, operate so as to secure positive reinforcement from teachers by deviating less under nurturance than under nurturance withdrawal (Saadatmand, Jensen, and Price, 1970).

(Maturity). Positive attention seeking increases from the under-five to the over-five age range, although some fives still show immature attachment patterns. Competent children direct more of their affiliative behavior toward peers and less toward adults, with the latter being restricted more to positive attention getting. They also show more adult-role behavior and peer leadership. They are more appropriately sex-typed, especially as regards aggression. More mature children have better self-direction in terms of social standards, but are also imaginative and show initiative and expressive freedom. Mature children have parents who exercise socialization pressure, expectancies for maturity, and who deal with the child at his level of understanding--thus their parents are neither restrictive nor overly indulgent (Ferguson, 1970).

(Sex-typing). Sex rather than race forms the major basis for spontaneous self-grouping by kindergarteners (Hirsch, 1967).

(Prosocial behaviors). Constructive responses of boys in doll play are greater at six than at four but are exceeded by those of girls at both ages (Moore and Ucko, 1961).

(Conformity). Fives are as conforming as under fives. Girls are more conforming to parents than to peers (Starkweather, 1967).

(Social skills). Higher SES fives are higher in personal social responsiveness than are lower SES, so the former are more adept at relating to their world (Howard, Hoops, and McKinnon, 1970). Mongoloid fives and sixes show social maturity beyond their mental ages (Thompson, 1963). Fives from a traditional kindergarten who are placed in a small-group problem solving situation manifest a range of more mature, facilitative social behavior for the task than do those from cognitive structured or creative aesthetic programs, with the cognitive structured group being at the greatest disadvantage in this task situation (Torrance, 1970).

Social perceptions and communications.--(Social abstraction). Internal consistency and reliability of the tendency to make socially desirable responses is greater among over fives than under fives. Older children and girls make more socially desirable responses (Cruse, 1966). This trend toward affirming of oneself socially desirable statements increases into first grade and then reverses itself (Cruse, 1963). Girls precede boys in this trend by affirming socially desirable statements less and negating socially desirable statements more during the latter portion of the preschool period (Cruse, 1966).

(Person preference). Dependency on adults is unrelated to popularity in four and one-half through fives, but it is negatively related for other under fives. Nurturance and dependency on peers relate positively to sociometric status (Moore and Updegraff, 1964). Early entrants into kindergarten are lower in social status than normal age children of comparable IQ who are matched with them on initial personality scores (Weiss, 1962).

(Emotional communication). Kindergarteners' conception of interpersonal kindness is a global, undifferentiated one in which many different reasons for benefitting others are all called kind. Between five and seven years, however, for 80 percent of the hypothetical situations posed, children's responses become more adult-like than among under fives. Yet for even the earliest to differentiate component of kindness, intentionality, children continue to develop into the second grade. Parochial education with its emphasis on motives behind actions apparently speeds up this process when compared to public education (Baldwin and Baldwin, 1970).

(Affective awareness). Accuracy of recognition of facially displayed emotions is greater among over fives than under fives, with performance approaching perfect by age nine among American and French children (Izard, 1968). Autistic fives, when given commands, do take into account the context and behavior of others. They vary response according to the type of command given, tend to comply for persuasive and not to comply for harsh commands. When workers value a context less, compliance is greater; when it is overvalued, noncompliance becomes characteristic. Those complying in this latter instance all display negative expressive behavior (Sussman and Sklar, 1969). Six- and seven-year-old children from a preliterate New Guinea group perfectly discriminate anger and disgust and happiness from surprise, and disgust from fear, and show far above chance accuracy for thirteen more paired comparisons (Ekman and Friesen, no date).

Motivation.--(Threat). A loud tone does not suppress lever pulling for which candy reward has been delivered, although it appears to evoke aversive responses in kindergarteners (Karsh and Williams, 1964), but if given before any reward, it partially suppresses later behavior.

(Failure/success). Combining verbal failure and success feedback reduces kindergarteners' errors on a plural-to-singular transformation problem compared to no feedback (Bryant and Anisfeld, 1969). A cue previously associated with reward facilitates extinction of a motor response if it is present during the extinction period because it enhances the frustrative effects of non-reward (Longstreth, 1966).

(Reward schedules). Scheduling punishment prior to rewarded trials suppresses a motor response, but scheduling punishment following reward does not suppress it (Karsh and Williams, 1964). Secondary reinforcement acts as a cue which interferes with the child's ability to discriminate between training, when primary reinforcement is absent (Myers and Myers, 1966), provided that the secondary reinforcer has not been invariably paired with the primary reinforcer, Capacity to await delayed reinforcement increases between five and seven (Mischel and Metzner, 1962). Prior overlearning (high habit) of a lever moving response under continuous reinforcement results in faster mean movement speeds over later non-reinforced, relative to reinforced trials. Partial non-reinforcement following both high habit and low habit results in faster responding over non-reinforced trials than does continuous reinforcement (Penny, 1960).

(Stimulus variation). Fear of visual novelty becomes evident during the first year of life and is moderately related to shyness throughout the preschool (e.g., r=.46 at four to six years) and early school period. This relation is small or absent for girls (Bronson, 1970).

(Preference). Kindergarteners receiving reading instruction develop better attitudes toward reading (Chen and Others, 1965), and toward school (Kelley and Chen, 1967), especially for girls, with low IQ girls benefiting most (Kelley, 1966). A modified linguistic approach to beginning reading also favorably affects attitude (Gruber, 1966). Fives come to prefer (72 percent) programmed instruction to one or more of the other activities in kindergarten (McNeil, 1964). Five-year-old girls shown pictures of various kindergarten activities prefer block play more than do boys (Margolin and Leton, 1961). Given an opportunity to take home cards displaying high versus low frequency words, kindergarteners pick high over low frequency for both nouns and adjectives, although about 20 to 25 percent of children do not show this preference (Bereiter and Summers, 1967).

Children prefer by a large margin drawings developmentally superior to their own (Lewis, 1963). Choosing the picture they most prefer, fives pick light units over bright saturated colors; photographs over black and white drawings, and illustrations with more colors over those with fewer colors. In contrast to under fives, they prefer true-to-life over fanciful drawings (Amsden, 1960). Kindergarteners view the physician as a smiling, helpful, and positive individual who is important in sickness and injury (Berger, 1960).

(Types of reward). Fives receiving a coin perform better than those receiving a metal washer (Leibowitz, 1966). Fives match letters well when given one M & M candy for each correct match while being penalized all candies for any row in which one match is incorrect (Hall, 1967). Kindergarteners persist longer on various tasks if given approval (without regard to correctness), whereas older children persist only when provided information as to correctness (Allen, 1966).

(Peer effects). Fives in pairs are more willing to try difficult skill tasks, least willing before a group, and intermediately willing when alone (Torrance, 1969). On the classic small-group influence on perceptual judgment of lengths of lines task, kindergarteners make only 12 percent of their judgments in a conforming direction, giving their own judgments without regard to stooges' responses (Hunt and Synnerdale, 1959).

(Teacher effects). Dominative and socially integrative behaviors of teachers affect group cohesiveness of kindergarteners little as regards type of group composition. The major group cleavage dimension is sex, with race a weaker secondary basis of grouping (Hirsch, 1968). Making teacher attention contingent upon specified behaviors markedly increases the frequency with which these behaviors occur, and the effect continues after the contingency is allowed to revert to a sporadic occurrence (Schulte and Hopkins, 1970).

Intra-psychic factors.--(Creativity). Conformity, as an alternative to creativity, varies according to the task and interpersonal situation (Starkweather, 1967).

(Self concept). Kindergarteners' self concepts are related to achievement, as are teacher ratings of children's self-attitudes. Teacher ratings are congruent with a non-verbal measure of the child's self concept. Sex differences in self concept are absent at this age (Ozehosky, 1967). Self concept appears positively related from preschool to primary a year later. Self concept relates positively to reading achievement and social development (Swayze, 1966).

(Personality, global). The Sceno Test with fives and older children corresponds somewhat to the Rorschach and can be used to make clinical inferences (Malmivaara and Kolho, 1961).

(Adjustment). Early entrants to kindergarten receive lower personality scores than normal age children of comparable IQ whose personality scores are originally matched. Early entrants of above-average IQ also receive lower personality scores than older children of average IQ (Weiss, 1962). Later socio-emotional development of early kindergarten entrants is markedly below that of older children (Gott, 1964). However, early entrants' first grade adjustment is as good as that of older entrants of similar MA, SES, and sex in classrooms having similar groupings, suggesting that their adjustment problems are not the result of CA (Loughlin, 1966). Kindergarten boys who are taught to read increase in problem behavior while girls decrease (Mason and Prater, 1966). Fives tend to good adjustment and comfortable conformity while after five and one-half conformity is abruptly altered by the child's extension of himself into new areas of experience and by his attendant discomfort at these new undertakings (Ilg and Ames, 1955).

(Emotionality). Sixes who engage in hospital-sitational doll play during hostpitalization later show more reality-orientation to the stress and less anxiety-defense reaction (Lockwood, 1970). Fives are not particularly fearful compared to sixes, with the former tending to visual and the latter to auditory fears. The overlap of their fears is, nevertheless, considerable (Ilg and Ames, 1955).

(Reactivity). Reactivity to visual novelty in infancy is consistently related to shyness both before and after age five (Bronson, 1970).

(Controls). Five and one-half to six and one-halfs respond 96 percent correctly to a preliminary verbal command which makes a motor response contingent on a prior visual signal. Some children have attained this by age four, but the process nears a maximum around six years (Beiswenger, 1968). Hyperactivity at this age negatively relates to later involvement in intellectual activity and analytic thinking. Despite this early predictive capacity, the overall tendency toward reflectivity among preschoolers is not great (Kagan, 1966). An increase in recognition errors marks the emergence of a more reflective style. It relates positively to reading skill development (Kagan, 1965).

(Fantasy). Free drawings of Montessori children include people significantly less often and geometric form more often than those of nursery school children. The latter show people in vibrant, lively activities (Dreyer and Rigler, 1969). Fives are frequently disturbed by bad dreams and return to sleep with difficulty, while sixes are more readily reassured. Fear of darkness follows a somewhat similar course (Ilg and Ames, 1955).

(Humor). Asian, African, and European fives laugh at above chance frequency only when the absurd is coped with by one of three strategies: pointing out the absurdity with criticism, wonder or mockery. Mere description of details is an inhibiting strategy for humor (Kreitler and Kreitler, 1970).

Anglo children of undesignated or mixed socioeconomic background, mixed ages

Social behaviors.--(Family factors). Longitudinally, maternal behavior is consistent on the love-hostility dimension but changes on autonomy-control. Throughout early childhood, boys' cooperation, friendliness, facility, and attentiveness relate to maternal love-hostility, and increasingly over time. For girls this is true early but later the relation disappears. Maternal hostility relates highly to mother's emotional maladjustment, to poor relationships with husband and others, and to environmental stresses and frustrations (Schaefer and Bayley, 1963).

(Dependency). Adult economic dependency is quite high among cerebral palsied individuals, who have been studied from early childhood. Higher level of self-care is one of the effective early indicators of probable capacity to function independently (Klapper and Birch, 1966).

Social perceptions and communications.--(Status awareness). Given special experience that favors one's looking at some beliefs and feelings of Negroes, young Anglos examine their concepts of racial difference and begin to verbally correct their faulty generalizations (Handler, 1966).

Intra-psychic factors.--(Self concept). Anglos have higher esteem than do Negroes (Henderson and Long, no date).

(Personality, global). Objective personality tests from a massive battery reveal as stylistic first order factors the following: narrow versus broad preferences, reflective versus impulsive closure, and persistent versus listless closure. Expressive first order factors are interest in dramatic play, fear of punishment, motor impetus, regressive debility, passive fantasy, and anxiety. Nine more cognitively-oriented factors also appear for preschool Anglos. Of the above factors, age differences appear for broad versus narrow preferences, persistent versus listless closure, motor impetus, and for five of the more cognitive factors (Damarin and Cattell, 1968).

(Fantasy). Adult initiation of activities in doll play fosters Anglo children's (33-66 months) self-directed fantasies with peers. It is exposure to ideas that fosters the use of ideas in play--not adult warmth, attention or lack of prior exposure to adult conversation (Marshall and Hahn, 1967).

(Adaptability to demands). Nurturance enhances the child's attention to the interpersonal environment and increases sensitivity to distractions. Non-nurturant permissive treatment produces the most task persistence (Mandel, 1968).

Negro children of undesignated or mixed socioeconomic background, mixed ages

Motivation.--(Types of reward). A token reward is superior to praise on a difficult paired-associate task, while information-only produces fewer errors than does reinforcement. While the token reinforcer is thus most potent, informative feedback alone may be sufficient. Reward, whether tangible or verbal, produces emotional side effects and can thereby interfere with learning (Teager and Stern, 1969).

Intra-psychic factors.--(Self concept). Negro children display lower esteem than do Anglos (Henderson and Long, no date).

Children of undesignated or mixed socioeconomic background, mixed ages, and mixed ethnic background

Social behaviors.--(Aggression). Bar pressing to create aggressive doll play probably does not differ between aggressive film and nonaggressive film treatments in fours through sixes (Lovaas, 1961). Doll play aggression increases in fours and fives following social isolation. Boys are more aggressive than girls. Aggression increases from the beginning to the end of a play session (Hartup and Himeno, 1959). With threes through fives, doll play aggression is greater both toward and from parent dolls than child dolls (Wurtz, 1960). Aggression is freely imitated without reward (Bandura and Huston, 1961). Fours and fives whose affiliative motive is aroused decrease in doll play aggression (Gordon and Cohn, 1963). An explicitly nonaggressive male model actually decreases children's aggression (Bandura, Ross, and Ross, 1961).

(Family factors). Threes through fives manifest greater social uncertainty, in the form of verbal hesitation about hypothetical social situations, if their parents are highly different in child-rearing attitudes or to the degree that the child's mother exceeds the father in warm personal contact with the child (Wyer, 1965). Some families of preschool cerebral palsied children develop a too-cohesive pattern, but they do not otherwise grossly differ from families which handle their exceptional child without a too-cohesive pattern (Schaffer, 1964).

(Imitative behavior). While aggressive models increase children's (37-69 months) aggressive behavior, the imitation is not restricted to aggressive responses. Boys imitate the aggression of a male model more than do girls (Bandura, Ross, and Ross, 1961).

(Identification). Children reproduce behaviors of a model more with social reward, although aggression is imitated freely without reward. Nurturance produces in children more predecision conflict behavior, suggesting that it facilitates social learning through incidental imitation (Bandura and Huston, 1961). Identification proceeds most effectively when adults control resources effectively (Berkowitz, 1964).

(Dependency). Highly dependent young retarded children have higher incidental learning and retention than do low dependent (Ross, 1967). Preschoolers' dependency behavior does not increase toward a familiar adult as a function of a stranger being present. Last borns are less dependent than first or middle borns (Karuven, 1963). Emotional dependency has a slightly negative relation to popularity (ages 3-6 to 5-3). Among Anglo and Hawaiian children, girls more than boys are emotionally dependent. Instrumental dependency, in the form of asking the teacher to resolve a conflict does not interfere with popularity (McCandless, Bilous, and Bennett, 1961).

(Sex-typing). Having IT displayed versus concealed results in es-

sentially the same outcome. Boys (41-66 months) obtain more masculine scores than girls do feminine scores (Endsley, 1967). Four- and five-year-old boys are less masculine as their mothers are more dominant, because children of both sexes tend to resemble the more dominant parent. Girls, however, identify equally with both parents in a father-dominated home (Hetherington, 1965).

(Prosocial behaviors). Cooperative behavior can be shaped in as high as two-thirds of children (4½ to 5½ years) using behaviors which are either absent or of low occurrence (Vogler, 1970). Nursery school and kindergarten children retain for themselves 72 percent of cooperatively earned pennies, giving their partner the smaller share. Sex differences are absent. A more equitable distribution occurs by the middle elementary years (Handlon and Gross, 1959).

(Social skills). Young educable mentally retarded children benefit vastly from a formal social behavior training program (Ross, S., 1967; Ross, S., 1969). Possible changes in early experience and nutrition have accelerated the social development of Hawaiian children so greatly on the Vineland as to suggest the need for new tests with new norms (Werner and Simonian, 1966).

Social perceptions and communications.--(Status awareness). Age relates to racial attitude development among Maori (black) and Pakeha (white) children of New Zealand. All children initially favor Pakeha dolls, followed by a decline in this tendency (Vaughan, 1964). Young children are influenced by their limited home experiences concerning the occupational and economic status of Negro and Oriental persons (Neidell, 1966).

(Social abstraction). Pictures representing "good," "bad," and "neutral" behaviors are discriminated at chance levels by twos and are almost perfectly discriminated by sixes. Bad is more readily identified than good at all ages (Rhine, Hill, and Wandruff, 1967).

(Social perceptions, other). Fours and fives manifest concrete views of grandparents in terms of specific physical characteristics, with further changes of view occurring at least up through age twelve. Fours and fives prefer older grandparents, apparently because their needs are congruent with affectional needs of elderly grandparents. Older children prefer younger grandparents (Kahana, 1968). Social perceptions are predominately assimilative, egocentric, and non-objective early in the preschool period. Gradually thought is adapted to others and to reality. Before this the young child does not bother himself with facts. Only gradually does he consider the objections of others and internalize them in the form of reflective thinking. Language permits the socialization of actions, giving rise to thinking that is less exclusively egocentric, because language makes available a complex system of collective concepts regarding the world of people (Piaget, 1967).

(Person preference). The young child generally has sympathy for persons who respond to him and value him. Antipathy grows from devaluation (Piaget, 1967). Emotional dependency is slightly associated with unpopularity, while the instrumental dependency of asking teacher intervention in conflicts is not (McCandless, Bilous, and Bennett, 1961). Youngest and only children have the most favorable peer relations, while oldest and middle position children are more susceptible to peer rejection (Sells and Roff, 1964).

(Emotional communication). Spontaneous feelings between the child and others grow from the enhanced exchange of values that comes with language. Empathy for another presupposes positive mutual evaluation occurs on the basis of shared values. For his superiors, the child develops the unilateral evaluation of respect (Piaget, 1967).

(Affective awareness). Fours through sixes who verbalize their feelings are perceived by their teachers as expressive, mature, empathic and imaginative. Older children verbalize feelings better than do younger (Gilbert, 1969).

Motivation.--(Reward schedules). Four and one-half through fives respond more following 50 percent than 100 percent candy reinforcement or token reinforcement (Meyers and Meyers, 1963). Fours through sixes can anticipate the repeated loss of an interest-holding television picture when they are trained on an appropriate schedule to maintain the picture (Baer, 1960).

(Stimulus variation). Children (37-66 months) who have prior familiarization with a toy are more likely to choose a novel toy in preference to it on a subsequent occasion. This is true even if the novel toy is damaged (Harris, 1967). Threes through fives have gross expectancies of a relation between object appearance and their own position in space, which causes many of them to respond by verbalizing surprise, perplexity or related comments about change when an unlawful subject-object relation occurs (Shantz and Watson, 1967).

(Preference). Selective attention to task increases in young mentally retarded children exposed to an experimental curriculum (Connor and Talbot, 1966). Almost all threes through fives affirm that they like friends or relatives to read to them (Mason, 1967). Of preschoolers (ages 2½ to 5½ years) who are polled on food preferences, 55 percent enjoy meals and have a positive attitude toward foods; 24 percent have varying attitudes, some-

sometimes eating well and other times not; 12 percent are indifferent to food; 6 percent are finicky about most foods; and 3 percent resist meals. Children's preferences somewhat resemble their parents', except that they have fewer likes than parents (Metheny and Others, 1962). Interests and values link to intuitive thought in general and are hence undergoing development during the preschool period. Interest is the prolongation of needs. Intuitive thinking multiplies and differentiates interests, giving rise to a progressive dissociation between the energizing mechanisms which imply interest and the values which are born through interest. In early childhood, realities acquire value for the child to the extent that they fulfill his needs, which in turn depend upon the incorporations that are required to maintain equilibrium (Piaget, 1967).

(Types of reward). Incidental learning of young mentally retarded children is influenced by reward but retention is greater following neutral comment than under reinforcement. Tangible reward is associated with lowest incidental learning. Intentional learning is highest under tangible reward, followed by praise, with neutral comment producing the least. Incidental learning is thus inversely related to motivational level (Ross, D., 1967b).

(Higher needs). Exposure to a fantasy theme is sufficient to arouse affiliation motivation in fours and fives. Affiliation arousal attenuates doll play aggression (Gordon and Cohn, 1963). High need achievement boys have parents who set higher standards for them and provide independence training and reinforce high performance. Social class differences are evident, favoring MSES. Both authoritarian and indulgent child-rearing patterns diminish need achievement. This motive does not, however, emerge in clarity until near the close of the preschool period (Berkowitz, 1964).

Intra-psychic factors.--(Self concept). Closely linked to the child's interests or activity-related values are individual feelings of self-evaluation such as superiority or inferiority. Subjective probabilities of success may arise from these evaluations (Piaget, 1967).

(Personality, global). Ratings of personality in brain injured pre-school children are more influenced by sex than by age and tend to present boys less favorably than girls (Graham and Others, 1963). Brain injured children are not as impaired in personality as in cognitive functioning (Ernhart and Others, 1963).

(Adjustment). The Kibbutz setting provides more adequate prevention and care for emotional troubles in early childhood than the urban community (Kaffman, 1965). The essential characteristic of children diagnosed as having infantile psychosis is ego fragmentation (Reiser and Brown, 1964).

(Emotionality). Children who are hospitalized briefly for medical reasons are less free and spontaneous at play than usual and are less verbal following the medical procedure (Vredevoe and Others, 1969). The two- through five-year-old child whose mother accompanies him to the hospital is less disturbed during the procedure and following his return home, with postoperative medical complications also markedly decreased. The more anxious the mother is about the hospitalization, the more disturbed the child is if admitted alone (Braine and Maclay, 1968). Reactions also vary as a function of the aspect of hospital procedure experienced (Vernon, Foley, and Schulman, 1967). Individual variations in response to the hypodermic needle are striking. Up until about three years, children evidence little emotional control, followed by a sudden increase of controlled reaction via self-imposed equanimity and compliance.

By four to five years, about 50 percent of children have negative reactions to injections (Kassowitz, 1958). A mildly arousing story increases Palmar sweating of the first three fingers among fours and fives (Lore, 1966).

In doll play fantasy, anxiety may function more as a stimulus than as an inhibitor (Wurtz, 1960). Children rated as high anxious or as showing separation concerns respond to a separation story with greater increases in fantasy play than do low anxious children (Hall, 1966).

(Controls). Language permits the child to respond to the psychological constraints of the adult. Obedience is the child's first moral precept, focusing thus on the will of the parents. Because of respect, thus, the child begins to act according to rules rather than simply because he likes or dislikes and thus does or does not wish to comply. But these moral feelings are intuitive and essentially subject to the will of the respected person. Thus, lies are not at first lies if spoken to peers but are wrong if spoken to adults because it is adults who prohibit lies. Later, his intuitive thought leads the child to believe that the more fantastic the lie, the worse it is. Only gradually does the issue of intentions emerge (Piaget, 1967). During early childhood children thus judge an act by its objective consequences. Rules operate like immutable laws. Advantaged children show more advanced forms of moral judgment than do DADV. More authoritarian upbringing impedes moral judgment's development. Explicit teaching of evaluation of deeds by motives fosters the development of moral judgment (Berkowitz, 1964).

(Fantasy). From two to seven the child alternates between assimilative thought and thought adapted to others and reality, with the latter gradually gaining dominance. Play is the vehicle through which this transition occurs, gradually being replaced by more mature forms of play and eventually by formal games with rules (Piaget, 1967). Some fantasy parallels to the above are observable in delayed form in the blind child (Wills, 1965).

In fantasy, anxiety functions as a stimulus more than an inhibitor (Wurtz, 1960). Affiliation arousal apparently attenuates aggressive fantasy (Gordon and Cohn, 1963). Although large mouthed, toothy toys are common in the play of preschoolers, an extensive preoccupation with these is remarkable in the play of cleft palate children, who also manifest in fantasy the theme of hurting and being hurt (Tisza, Irwin, and Zabarenko, 1969).

(Adaptability to demands). Preschool girls subjected to cognitive demands orient themselves more rapidly than do boys, while boys are more likely to respond to the challenge of cognitive difficulty (Moriarty, 1961). A problem that plagues analysis of the child's willingness to undertake difficult tasks is the relation between skill and willingness, because older children are more skillful than younger on a variety of psychomotor tasks (Starkweather, 1966).

Social-cultural-familial influences.--(On general development). Ego development of Kibbutz children may be initially retarded by their group experience, but by the time they are five years old they have overcome personal-social deficiencies that were earlier evident (Robin, 1968).

Summary of findings in affective domain

Comparisons of ADV and DADV are somewhat easier for the affective domain than for the other domains. Ethnic comparisons are strikingly absent with a few notable exceptions. Age comparisons are frequently possible and tend for several characteristics to yield data that are useful for the establishment of developmental guidelines. Overall, however, numerous gaps are apparent in the data. Replication occurs more commonly and for a greater variety of characteristics in this than in either of the other domains.

Socioeconomic differences.--ADV display both less hostility and warmth than DADV. Overt and fantasy aggression are unrelated in both ADV and DADV groups. Aggression is extensively studied among ADV and little studied among DADV. No comparative studies are found for dominance or situational factors. ADV children are less dependent on siblings than are DADV. ADV mothers provide more social reinforcement and fewer authoritarian interventions and more affection-based interactions than do DADV. ADV mothers provide greater structure, direction and teaching than DADV when told that their child is immature or unstructured. No social behavior differences are reported by SES groups for imitation, identification, resistance to temptation, dependency, transgression, maturity, or sex-typing. ADV appear more ready to share following social reinforcement than do DADV. Both ADV and DADV assist peers only when cues for cooperation are present. DADV are slower than ADV to acquire sharing behavior. SES comparisons are not reported for introversion, conformity or social skills.

Differences in social perceptions and communications appear for perceptions of school, with DADV mothers viewing demands of school in terms of conformity, obedience to routine, and teacher authority while ADV mothers have a more positive, optimistic outlook. ADV children are superior to DADV in social status recognition from life-situation pictures. Other social perceptions categories do not differentiate by SES.

DADV are slower than ADV children to manifest form preference in similarity matching. DADV mothers give lower predictions of success for themselves and their child in a joint work session, thus revealing their low level of aspiration. Harsh threat produces greater devaluation of a forbidden object for DADV and mild threat for ADV. ADV children reinforce more children whom they are teaching than do DADV. ADV nursery schoolers do not persist on a task as long as DADV of similar age.

Family instability among DADV increases the risk of disrupted object relations over that of ADV. ADV children are more divergent thinkers than are DADV. DADV are more impulsive than reflective, in contrast with ADV. Self concept among DADV may be extremely defective.

Age differences.--Aggression relates positively to empathy in boys under five and not among girls; while among older preschool boys the relationship becomes negative. Interpersonal aggression increases with age, as does tattling, in boys. Initially non-autonomous boys undergo a transformation over time from aggression to instrumental dependency. Aggression and dominance peak between four and one-half and five and one-half. Among under fours, doll aggression relates negatively to dependency but is unrelated at four. At five more controlled, verbal and indirect forms of aggression are replacing the diffuse physical aggression of under fives. Fives exceed threes in ascendance.

Identification of dolls which are dressed like classmates as representing children increases from three to four years. Directly observed dependent behavior declines with age, with threes making more contacts with adults than peers but older children reversing this trend. Dependent behaviors are decreasing.

Helpful behaviors increase from three to four to five years and are quite low among under fives. Autonomy is also on the increase from three to four to five. Positive attention seeking increases from the under-five age range, although some fives still show immature attachment patterns.

Under fives play less with sex-typed toys than do older children. Older children of both sexes avoid inappropriate sex-typed toys more than under fives. An adult's presence does not affect girls' behavior but is more likely to suppress sex-inappropriate toy selection among older than among younger boys. Sex differentiated human figure drawings increase from 1 percent at three years to 46 percent at six. A mouth is more predictably added after 46 months.

Constructive doll play of boys is greater at six than at four but is exceeded by that of girls at both ages. Fives more than younger children are likely to initiate peer interaction. However, these approach behaviors more often assume the form of aggression or dominance at this age. Fives use more suggestions and agreement in dramatic play than do younger children.

Children increase their mean number of peer interactions from three to four years, showing a greater degree of interpersonal interrelatedness at four. Negative mood interactions with peers decrease and those with teacher increase over the same period. The focus of action thus shifts to the peer group. Girls' conforming behavior gradually rises up to age five, whereas boys' drops sharply from four to five years. Racial awareness appears to be quite low in under fives. Social perceptions, generally, are more stable among fours than threes.

Affirming oneself to have socially desirable characteristics increases into first grade.and then reverses itself for positively worded statements. Social desirability responding consistency is low at age three and.up at age four. Girls precede boys in this development. The understanding of bad first comes into focus around age two and increases by three to four years. Fives still understand such double function terms as sweet, hard, and crooked primarily in terms of their physical referents, yet are more abstract than under fives.

Egocentric speech declines early for bright children and displays a slight increase from four onward for average children. Children from four to five years increase in their ability to discriminate on the basis of age. Kindergarteners more so than older children expect more benevolence and less self interest from other people. Fives show longer latencies before selecting preferred peers' photos than non-preferred peers' photos. This is exactly opposite the reaction of younger children. Fives and sixes more than threes and fours are susceptible to social influence in the form of tending to adopt the language that has previously been used by an adult examiner. Threes and fours assume the perspective of the other person only sporadically; fives show slight and sixes show marked improvement over the younger children. Fours give more positive attention and approval to peers than do threes. Some fives can use the structure of a story context to comprehend facial expressions of emotion. Four and one-halfs more so than younger children are appropriately described in terms of activity-passivity. Threes and fours recognize with high accuracy photos depicting emotions and increase their accuracy each year until around nine.

Symptoms expressed by preschool children are primarily at the overt behavioral level, although by school age these may be expressed as reflecting complex subjective states. Visual fears are more prominent at age three and auditory at age four. Three and one-halfs may be disturbed by dreaming but are easily quieted. Four and one-halfs often dream with greater distress. The early form of child-mother attachment has begun to weaken at around three years. At age five children of both sexes create greater inner complexity of characters in their stories. Autonomy themes are greater at three and five years than at four for both sexes.

By age five many ADV children attend to form as a basis for attributing object similarity. Fives manifest an increasing interest in television program segments, compared to younger children.

Ethnic differences.--ADV Negro children are less likely than Anglos to imitate a model's behavior if he is rewarded for deviance. Naturalistic studies of sharing rates show these are higher for ADV Anglo than DADV Negro. Anglos give more cooperative responses than do Negroes. Mexican-American boys cooperate as much as Negroes when it is not reciprocated, but less than Negroes when they are reciprocated. Negro, Mexican-American and finally Anglo girls rank in the preceding order on trusting, cooperative behaviors. ADV Anglos respond to cognitive demands with a greater proportion of work responses than do DADV Puerto Ricans. Anglo girls are less disturbing and disruptive than Negro girls. Anglo boys are less lethargic or apathetic and display more energy than Negro girls, which may be due to the generally greater activity level of boys.

ADV Negroes in both North and South prefer Anglo to Negro children in pictures. Ninety-four percent of Anglo kindergarteners identify themselves with dolls of their own race compared to 64 percent of Negroes.

Anglos have higher self esteem than do Negroes. Divergent thinking is higher among ADV Negroes. Puerto Rican Head Start mother-child pairs are more active in the home than in the school setting and twice as active as Negro pairs in communications which encourage exploratory behavior and learning. Anglos initially form attend more than Negroes or Indians, but the latter two groups make greater gains than Anglos in form attending during a nine-month Head Start program.

CONCLUSIONS

The purpose of this report has been to analyze the research conducted during the last ten years on the characteristics of three- through five-year-old children in order to identify current thinking with respect to developmental factors which characterize the preschool child a) at different age levels, b) from different social strata, and c) from different ethnic backgrounds.

Selected journals, indexes, and other reference materials were searched to identify studies and fugitive literature concerned with the development of three- through five-year-old children and were then abstracted by a group of nine reviewers assigned to read in areas of their own expertise. These abstracts were first sorted into three domains of behavioral characteristics--psychomotor, cognitive, and affective. Each domain was then sorted into advantaged, disadvantaged or undesignated as to socioeconomic status. Each of these categories was sorted by age into under five years old, five years old and mixed. Finally, each of the age categories was sorted by racial-ethnic background into Anglo, Negro or mixed. Within this sort final analyses were made on the basis of a categorical system within each domain (Appendices A and E).

The majority of studies included are drawn from recognized professional journals, ERIC materials, doctoral dissertations and unpublished reports obtained directly from the authors. Because of the tight time schedule under which the study was conducted, there was no time to fill in gaps. Although most of the important research is believed to be included, it is recognized that some major research, published in book form, has been missed. It is estimated that the sampling of research which has been summarized represents approximately one-third of the total volume of data available.

At the end of each domain an attempt was made to summarize the findings in that domain regarding advantagement-disadvantagement, age, and ethnicity. What emerges from this is that one cannot summarize the available research into any concise, clearly defined statements about the growth and development of three- through five-year-old children. What we have is a collection of studies which are often related only in that three- through five-year-old children were used as subjects. Although studies were organizable in the same general categorical classification, the questions they attempt to answer are different and the methodology used is also different, usually resulting in findings which are sufficiently different to demand caution in generalizing from the combined results.

Obviously it is always dangerous to take research which was intended only to answer one specific kind of question and try to relate it to a larger question unless the study has been so planned. In fact, what was discovered was that the research did not focus on the types of questions to which answers were sought; that while the category system provided a very satisfactory means of exaimining the data, the content of the data did not provide informational input or the volume of data in each category essential for the development of a taxomony of behavioral characteristics, even though this was occasionally possible.

Specifically, it was found that comparisons between ADV and DADV, between under fives and fives, and between Anglo and Negro children were difficult due to the nature of the data. Few studies made explicit statistical comparisons of ADV and DADV although both groups were represented in many of the studies. Studies of one SES level have not often been replicated with children of another SES level. The same problem holds for differences in Anglo and Negro children in terms of comparative data and replication of studies. Categories with headings such as mixed and undesignated as to SES and ethnicity consistently contain more data than the specifically designated categories in all three domains. Researchers, in other words, have given little attention to these demographically-related variations in children's characteristics. Data tend to be reported in terms of scores on particular tests or as experimental factors affecting performance on a specific task rather than on developmental abilities. Characteristics of children may be inferrable from this research but the great majority of the research is not directly concerned with developmental characteristics of children, so the inferential process becomes tenuously tied to real data. More detailed summaries of the three domains will be found respectively on pages 68-73, 256-266, and 370-376 for psychomotor, cognitive and affective.

In the psychomotor domain, in particular, few studies focus on one age group while the majority include a two to five year age span with infrequent designation of the actual abilities of children at a given age. More than one-half of the data are undesignated as to SES level. Great gaps occur in the data. There are no studies of ADV Negro fives or ADV Negro children of mixed ages and only three studies of ADV Negro under fives. Only one study of ADV under fives with mixed ethnic background and only two studies of ADV five-year-old children with mixed ethnic background are available. The greatest gaps in DADV are in data on Anglo children, with only four studies on DADV Anglo under fives and three studies on DADV Anglo children of mixed ages. While there are more data, on the whole, in the undesignated SES categories, there are gaps there also. The analysis shows only one study of Negro children with undesignated or mixed socioeconomic background, mixed ages and four studies of Negro under fives of undesignated or mixed socioeconomic background. Most of the psychomotor research, therefore, is based on Anglo ADV children, Negro DADV children and mixed socioeconomic groups with little available data on Anglo DADV and Negro ADV.

Unlike the psychomotor domain, most of the studies in the cognitive domain focus on specific age groups. Most of the studies, however, do not make comparisons between ADV and DADV. Studies at one socioeconomic level have not been replicated at the other socioeconomic levels, and studies with Anglo children have not been replicated with Negro children. Most studies that included several ethnic groups fail to report findings by ethnicity but rather give total group results. The comparisons are further hindered by the lack of studies in several demographic categories of major interest. There are no studies of ADV Negro children, mixed ages; only five of ADV Negro five year olds; only four of Negro children of undesignated or mixed socioeconomic background, under five years of age; and only three of Negro children of undesignated or mixed socioeconomic background, mixed ages. There are only three studies of ADV Anglo children, mixed ages; only six of DADV Anglo, under five years of age; and only one of DADV Anglo children, mixed ages. Thus, because most of the studies of DADV are with Negroes and studies of ADV are with Anglos, racial and socioeconomic comparisons are at best tenuous since in either event the second variable is not held constant.

The studies of affective domain characteristics more frequently make reference to ADV and DADV status. For example, the ratio of designation to non-designation of socioeconomic status is about two to one for affective studies compared to about one to one for cognitive and only one to two for psychomotor. About one-half of affective studies are of ADV, one-sixth DADV, and one-third undesignated. Ethnicity remains undesignated frequently and potential comparisons confound socioeconomic status and ethnicity often enough to obviate many statements about the data. Studies of Anglo ADV far outnumber Negro ADV, while Negro DADV slightly outnumber Anglo DADV. Age is designated much more often than not in studies of both ADV and DADV and likewise among those of undesignated socioeconomic status. Overall, this permits many age comparisons. Further, studies designed for direct age comparisons of affective characteristics are proportionately much more numerous than those in either of the other domains.

Social behaviors, the most studied characteristics, are studied most among ADV, with all other categories assuming secondary importance. Among DADV, social behaviors and intra-psychic factors are studied about equally often. Undesignated counts are similar to those for DADV, with studies of intra-psychic factors slightly exceeding those of social behaviors.

The literature (within each domain) is clearly too piecemeal to be more than suggestive of the composition of future taxonomies or comprehensive descriptions. Relationships among variables within a domain are not shown and appear not to have been investigated in any systematic way. Across domains, especially, relationships among variables have not been investigated. As a result we do not know what varies with what. Normative data are rare.

Little can be concluded about the relationship between programs and outcomes for several reasons: a) because the children receiving services do not necessarily receive those specifically designed to meet their developmental and educational requirements; b) because statements of programs and objectives are vague with reference to any general cause-effect contention and are of necessity attempts by well meaning people to act constructively in the absence of necessary information on what affects children's progress (Miller, Scott, and Eklund, 1970); and c) because implementation of even carefully derived and developed programs does not necessarily match what actually happens in the day care center or classroom or on the playground. The compulsive concentration of evaluators on description of changes in children only, in the absence of direct measurement or observation of the teaching process, leaves so great a gap in knowledge as to make most program related outcomes uninterpretable, except to those of the most speculative bent.

Several recommendations seem to follow from the data analysis. As long as each researcher or each research center continues to follow a particular interest with little or no coordination with the work of other researchers, the situation which currently exists is apt to continue. Basic researchers have to look at the problems that have been highlighted here and begin to plan their research so that it will fill existing knowledge gaps. Currently, millions of dollars, both federal and private, are going to research which is so fragmented, so remote from classroom practice, and so minute in what it attempts to measure that it is virtually impossible to derive from it any adequate guides for program planning, as our current effort so amply attests. Greater coordination is needed not only in determining what needs to be investigated but also in developing methodology which would permit acquisition of comparable data on different populations.

Second, strong emphasis should be placed on selecting variables which could be studied across the demographic categories used in this literature search so that some of the deficiencies in the current data would be remedied. This is an essential first step toward revealing how children from different backgrounds and of varying ages differ functionally--and only with this knowledge can we begin to seek explanations in child-rearing practices, community factors, and preschool programs for why these differences exist. From these steps one would eventually arrive at a point of knowing what programs should attempt to deal with and why. Impatience in working through these steps currently appears in the form of demands for demonstrated effectiveness of treatments before a reasonable knowledge base exists for speaking to the question. We take it that although America's preschool children are a national resource, they are not a commodity to be experimented on by people whose only knowledge base is that something is not working. Comparable degrees of "no-knowism" in defense, space or other areas of national priority are simply unheard of. More research and development money goes into putting one man into space than millions of young children into life. The research and development effort should go into longitudinal research on many variables essential to both the determination of developmental trends and for the evaluation of program effects. For example, one question which must be answered is whether DADV children follow the same developmental pattern as ADV children, only at a slower rate, or whether distinguishable differences are found in the developmental pattern. Many such questions should be explained. This does not mean that nothing should be done in the way of program, but surely what is done should be in those areas where children are least likely to turn out to have been the guinea pigs of an eager and sometimes devouringly blind technology of "people change."

If research and evaluation measures are set up from a more developmental perspective, the data obtained will be more directly applicable to program planning. The evaluation measures also may be developed to be used as descriptive devices for obtaining information about the children to the profit of the ongoing program. This can most reasonably be accomplished as indicated below.

Tying research more systematically to ongoing programs is essential if results are to be interpreted in terms relevant to classroom experiences of children. Thus, it becomes essential that programs define their goals and methods in order that program outcomes can be evaluated. Practitioners need to be involved more in an integrated system of evaluation just as researchers need the input of the practitioner in order to plan research which is directed toward the developmental and programming questions to which answers are needed.

An important contribution of this project has been to raise questions about the myth that educational programs rest upon a sound research base. However, the contradictions and gaps are such that programs which attempt to provide balanced experiences in the psychomotor, cognitive and affective domains must be viewed as tentative and therefore must compensate extensively on the basis of the program planner's experience and judgment. This calls for highly qualified program planners, since they must remediate by their wisdom our shared ignorance of how the parts fit together. It further calls for qualified and sensitive adults to implement programs, because educated guesswork requires high fidelity feedback from program recipients--the children involved.

APPENDIX A

385/386/387

List of Journals Searched

American Journal of Mental Deficiency
American Journal of Orthopsychiatry
American Journal of Pediatrics
American Journal of Nursing
American Montessori School Bulletin
British Journal of Educational Psychology
Canadian Journal of Psychology
Child Development
Child Development Abstracts
Cumulative Index Medicux
Current Index to Journals in Education
Current List of UNESCO Publications
Developmental Psychology
Education Index
Educational Psychology
Exceptional Child
Exceptional Child Education Abstracts
Excerpta Medica
Family (The)
Genetic Psychology Monographs
Harvard Education Review
International Encyclopedia of Social Science
International Humanities and Social Science Index
Journal of Abnormal Social Psychology
Journal of American Academy of Child Psychology
Journal of Educational Psychology
Journal of Educational Research
Journal of Experimental Child Psychology
Journal of Genetic Psychology
Journal of Marriage and the Family
Journal of Negro Education
Journal of Nursing Education
Journal of Personality and Social Psychology
Journal of School Psychology
Journal of Social Psychology
Journal of Social Work
Journal of Special Education
Mental Retardation Abstracts
Merrill-Palmer Quarterly
Monographs of Society for Research in Child Development
Peabody Journal of Education
Perceptual and Motor Skills
Phi Delta Kappan
Psychological Abstracts
Psychology in the Schools
Research in Education
Sociological Abstracts
UNESCO Catalog and Publication Lists
Young Children

APPENDIX B

Circle Code Abstract Sheet (Abstract #__________)*

Author(s)__________

1st Author Affiliation or Address__________

Title__________

Publisher or Publication__________

Volume-date-pages (or document source)__________

Research setting__________

C.6 Advantaged=1 Disadvantaged=2 Both=3
Middle, Suburb.=5; Headstart, Instit., Inner City=6, Upper lower=7, Unidentified=8
C.7 Age 3, 4, 5, mixed=1/ N S=__________
Nursery=0, Headstart=1, Kindergarten=2, 3 and 4=6, 3 and 5=7, 4 and 5=8, 3,4 and 5=9
C.8 Sex Boy=1, Girl=2, Both=3/ N S ______, ______, ______,

C.9 Negro=1, Anglo=2, Spanish Surname=3, Indian=4, Mixed=5, Others=6
From category 5, Negro=7, Anglo=8, Span. Saxon=9, Indian=0
9A N Ss ____, ____, ____, ____, ____

C.10 What investigated? Task-oriented=1, Non Task oriented=2 *(See definitions)

C.11.12.13 Task Name__________Code (/ /) Name
(For overflow use columns 61-66 per guide).
Task as in study; Code as on Guide #1. Repeat Cols. as needed.

C.14.15.16 Instrument(s)__________Code (/)
(For overflow use columns 44-49 per guide)
Code as on Guide #2. Repeat Cols. as needed.

C.17 Test used by Teacher=1, Pupil Personnel Specialist=2, Researcher=3
Combination of these=4

FAMILY-COMMUNITY FACTORS

C.18 Child socioeconomic level? (Guide #3) Hi=4, Med=3, UL=2, LI=1 Mixed=5

C.19 Type Residential Area? Single family=1, Duplex=2, Apartment=3

Subsidized Project=4, Heavily congested=5, Institutional=6, Mixed=7

19A Describe:__________

C.20 Family together? Intact=1, Broken=2, Placement=3, Mixed=4

C.21 Residential location Rural=1, Suburban=2, Inner City=3, Migrant=4, Comparative=5

C.22 Description of family characteristics__________ Avail.=1 Not Avail.=2

C.23 Description of parent-child interaction__________ Avail.=1 Not Avail.=2

C.24 Child's Position in Family Firstborn=1, Middle Child=2, Last Child=3, Twins=4
Mixed=5

*means--see continuation entry. N/A=not available.

TYPES OF PROGRAM

C.25 Non-public Coop. NS=1, Coop. kg.=2, Private NS=3, Private kg.=4, day care=5, parochial NS=6, parochial kg.=7, Multiple program=8 Specific program=9 (spec. Ed)

C.26 Public NS=1, kg.=2, day care=3, community=4, Multiple=5, Compar. Pub.-Non Pub=6, Spec. Ed.=7

C.27 Federally funded Title I=1, Head Start=2, Title III=3, Day care=4, Community=5, Other=6 (NIMH Coop Res, etc.)

C.28 Where program housed? Part of elem. or priv. school=1, Separate=2

28A. Relationship between school & community? ______________________________.

SERVICES PROVIDED BY PROGRAM

C.29 Medical? No=1, Yes=2

C.30 Dental? No=1, Yes=2

C.31 Nutritional (Milk, lunch)? No=1, Yes=2

C.32 Social services? No=1, Yes=2

C.33 Parent involvement? No=1, Yes=2

C.34 Volunteers used? No=1, Yes=2

CURRICULUM DESCRIPTION

C.35 Program type Code____________. (Follow Guide #4) (Code program being evaluated) (Overflow to Col. 53)

C.36 Length of school day. Round to nearest hour. _______________Code.

C.37-38 Ratio (teachers + aids/children) __________Code. Compute & entered rounded denominator with numerator equal to 1. If 9 or less use Col. 38 only.

C.39 Qualification of teachers and aids__________________________Avail.=1
Not Avail.=2

PROGRAM OUTCOMES

C.40 Behavior changes hypothesized__________Code. (Follow Guide #5) (For Programs only) (Overflow to Col. 50 for physical, also to 51 and 52)

C.41 Relationship & Primary Performance Checked? No=1, Yes=2

C.42 Findings support=3, Mixed=2, Do not support=1 hypothesis in C-40.

42A Findings____

____

43. Reprint available 1=no, 2=yes.

43A Conclusions of investigator____

____

44A Reviewer's Comments____

C.70 International Non-Comparative=1, Comparative=2

C.71 International Areas-See Guide #6

APPENDIX C

395/396/397

Coding Guides

Guide #1
(Columns 11, 12, 13)
Characteristics Investigated

Code	(Col. 11--Cognitive) (Use Cols. 61 & 61 for overflow)
0	Ability: specific
1	Attentional processes (selective, directed, set)
2	Concepts (categorization, classification, similarity matching, labelling, concept attainment)
3	Creative processes (imagination, intuition, creative play) (See also Psychomotor: 1)
4	Intelligence: general (verbal, nonverbal)
5	Language (excluding sound production) (See also Psychomotor: 7)
6	Mediational processes (information processing, mediated generalization, sequencing in idea production, higher associative processes)
7	Memory (serial, paired associate, general content)
8	Perceptual (sensory coordination, perception of sequential events, cognitive styles, recognition, closure, flicker fusion) (See also Psychomotor: 4)
9	Piagetian tasks & related general cognitive-theory based tasks (sensory-tonic field theory, Gesellian, problem solving)

Code	(Col. 12--Affective) (Use Cols. 63 & 64 for overflow)
0	Attitudes toward things & concepts (not toward self & other persons)
1	Defenses or adaptive mechanisms
2	Emotional communication: expression or recognition (mood, affective states, facial and other non-verbal means)
3	Interpersonal behavior (attitudes toward people, assertiveness, dependency, social distance, altruism, sharing, empathizing, social attachment, imitation)
4	Motivation (interest, preference, taste, values, reinforcer effects)
5	Personality (intra-psychic organization, character, sex-typed behavior)

Code

6 Psycho-sexual stages (fixation, regression, development of drive controls, identification)

7 Self-concept, self-acceptance (body image)

8 Stress reactions (psychophysiological, psychosomatic. Cf. 1 & 2)

9 Temperament (stimulus sensitivity, activity level, arousal)

Code (Col. 13--Psychomotor) (Use Cols. 65 & 66 for overflow)

0 Balance, movement, and coordination (static or dynamic, with or without apparatus, gross motor, kinesics)

1 Construction with manipulables (See also Cognitive: 3)

2 Dominance, handedness, laterality, eye dominance

3 Growth and maturation (skeletal age, somatic proportions)

4 Perceptual-motor (fine motor, drawing, copying, hand-eye coordination, sensory and motor aspects of perception) (See also Cognitive: 8)

5 Play

6 Self-care activities (dressing, toileting, grooming, feeding)

7 Speech: motor aspects (See also Cognitive: 5)

8 Vitality (endurance, fatigue, recovery)

9 (Open category)

Guide #2
(Columns 14, 15, 16)
Instruments Used

Coders: Use leftmost column (14) for Cognitive Instruments, etc., as indicated below.

Col. 14 Cognitive
Col. 15 Affective
Col. 16 Psychomotor

Use Guide #1 codes for recording instrument types. Remember, however, the fixed order of code placement for columns 14, 15, and 16. This differs from the flexible placement in columns 11, 12, and 13. If you require additional space on the machine scored sheet, you may use the following undesignated columns:

Columns 44, 45 Cognitive (continues Col. 14)
Columns 46, 47 Affective (continues Col. 15)
Columns 48, 49 Psychomotor (continues Col. 16)

Guide #3
(Column 18)
Socioeconomic Level

Code

4 Upper--Children of administrators, executives, higher level professionals, entertainers, military commanders, higher level politicians, independently wealthy. Many samples designated "high" are really middle class. Income will not be used, since the index varies from time to time.

3 Middle--Small business owners, foremen, white collar workers, larger farm operators, middle and lower level professionals, some service workers (more subtle factors separate these into UL and Middle), technicians, engineers. These persons are usually salaried.

2 UL--Upper lower class--Blue collar workers (may have as high or higher income than white collar but are "working class" oriented), small farmers, tradesmen, semi-skilled, many service workers (e.g., laundry, food service), truckers. These persons usually work for wages. Some of the "technically" disadvantaged fit here.

1 LL--Lower lower class--Unskilled or minimally skilled workers, the unemployed, many of the disabled, the tenant farmers, migrants, welfare families. Lower lower is perhaps best understood as involving a style of life created by the uncertainties and tensions of poverty and the traits of instability, restlessness, external locus of control, apathy, and a sense of powerlessness.

Guide #4
*(Column 35)
Curriculum--Program Type

*Continuation categories for Guide #4 are shown below. Leave Column 35 blank if you are using the continuation categories.

Code

0 British Infant School Type

1 Diagnostically based--tests children in multiple areas and plans activities on the results.

2 Head Start and other general group remediation.

Code

3 Imitative behavior, modeling--uses tendency of child to copy adult or older child behavior to promote younger child's behavior development.

4 Learning to learn--particularly teaching children "cognitive strategies" for dealing with learning situations.

5 Montessori

6 Psychoanalytic or other dynamic orientation to early drive and activity management.

7 Specific deficits--(structured)--language remediation by closely regulated drill, etc. Bereiter-Engelmann is an example. Can include mother treatments for specific deficits.

8 Specific deficits--(unstructured)--programs hypothesizing effects on specific deficits in child, but using more global treatments to change these. "Diffusion Effects" of DARCEE is an example.

9 "Traditional" or Nursery School--multiple play activities centers, child exercising choice among these, continuation of mothering.

*Guide #4 Continuation Categories (Column 53--leave blank if Column 35 was used.)

Code

1 Operant or other reinforcement procedure as a program

2 Peers as teachers or tutors

3 Reading or number based readiness kindergarten

4 Maternal teaching; family effectiveness

Guide #5
*(Column 40)
Behavior Changes Hypothesized or Attributed to Program (Only)*

(For non-behavioral changes, such as changes in the child's physical or dental status, see continuation below.) (For overflow, see below.)

Code

0 Academic Achievement.

1 Attention improvement or better structuring of own activities.

2 Cognitive skills--specific effects (See Guide #1 for some which might be so classified).

Code

3 Intellectual development--general, would include many true "conservation" studies for increasing generalized cognitive properties.

4 Language development.

5 Motor skills, balance, coordination.

6 Perceptual skills--include intersensory coordination.

7 Self-image or self-concept.

8 Skills important to school.

9 Social development--includes interpersonal behavior toward self, children, and adults.

*(If the research report is of a specific treatment, and no program is involved, leave Column 40 blank. Behavior changes hypothesized will be presumed to be coded only when they are program related. Otherwise, in retrieval, we will find more specific behavior changes hypothesized by looking in abstract columns 11-13 and 14-16 and their overflows. These should reasonably reflect for retrieval purposes the behavioral changes hypothesized.)

Guide #5 Continuation Categories (Column 50)--Physical Changes (Primarily for the pediatrics review)

Code

0 Physical growth (ht., wt., growth status)

1 Dental status

2 General health

3 Accidents

4 Nutritional status

5 Physical handicaps

6 Laboratory tests

7 Fatigue and recovery

8 Visual status

9 Auditory status

Overflow (Columns 51 & 52)--Coders: If more than one behavioral change is hypothesized in a single study, the first one would be recorded as above in Column 40. If a second and third change are hypothesized, they can be recorded, in order, in column 51, then column 52.

Guide #6
(Columns 70, 71)
Comparative Study: Areas

Code (Column 70)	
1	Non-comparative study
2	Comparative study

Code (Column 71)	
0	Great Britain
1	Russia
2	Israel
3	Canada, Australia, New Zealand
4	Europe
5	Middle East
6	Africa
7	South America, Caribbean
8	Asia
9	U. S. and Territories

APPENDIX D

404/405/406

Categories for Analysis of Data in Psychomotor, Cognitive, Affective Domains

I.	Advantaged	Under 5	Anglo
II.			Negro
III.			Unidentified or Mixed
IV.		5	Anglo
V.			Negro
VI.			Unidentified or Mixed
VII.		Mixed	Anglo
VIII.			Negro
IX.			Unidentified or Mixed
X.	Disadvantaged	Under 5	Anglo
XI.			Negro
XII.			Unidentified or Mixed
XIII.		5	Anglo
XIV.			Negro
XV.			Unidentified or Mixed
XVI.		Mixed	Anglo
XVII.			Negro
XVIII.			Unidentified or Mixed
XIX.	Undesignated or Mixed	Under 5	Anglo
XX.			Negro
XXI.			Unidentified or Mixed
XXII.		5	Anglo
XXIII.			Negro
XXIV.			Unidentified or Mixed
XXV.		Mixed	Anglo
XXVI.			Negro
XXVII.			Unidentified or Mixed
XXVIII.		Summary	

APPENDIX E

Revised Affective Categories

Social behaviors

- Aggression / Empathy
- Dominance / Submission / Resistance / Assertiveness
- Situational factors maintaining interpersonal behavior
- Familial factors maintaining or teaching interpersonal behavior
- Imitation and vicarious imitation
- Identification and imitation / Role taking
- Resistance to temptation / Dependency / Leniency toward dishonesty
- Dependency
- Transgression related behaviors (guilt, defenses)
- Maturity / Responsibility / Self-directed behaviors / Autonomy / Competence
- Sex-typing
- Pro-social approach / Cooperation / Sharing / Generosity
- Introversion-extroversion
- Conformity / Acquiescence-negativism
- Social skills / Knowledge of social skills

Social perceptions and communications

- Abstract awareness of ethnicity, SES
- Self-awareness with reference to categorical membership or face-to-face other-awareness
- Perceptions of school and learning
- Abstraction in social reference, social desirability
- Social perceptions, other
- Person preference / Sociometry
- Emotional communication
- Awareness of affect

Motivation

- Threats / Punishment
- Failure / Success / Frustration / Behavior constraints
- Rewards / Reward schedules / Delay of reward
- Stimulus variation / Novelty / Complexity / Expectancy violation
- History of preferential behavior / Interests / Attitudes / Values
- Types and agents of rewards / Attention holders / Secondary reinforcers
- Peer maintenance of behavior
- Higher needs, motives (achievement, affiliation, curiosity)
- Teacher maintenance of behavior (e.g., by attention)

Intra-psychic factors

- Neuroticism versus acting out
- Orderliness

Creativity / Playfulness / Tolerance of ambiguity
Self concept (apart from social position) / Body image
General personality (test or rating scale) / Morality
School, social or personal adjustment
Activity level or energy
Characteristic emotional state / Mood / Stress reactions / Tension release
Locus of control
Reactivity to stimulation (threshold, intensity)
Inhibitory behaviors / Inner controls / Impulsivity
Fantasy content
Responses to cognitive demands / Task persistence
Humor
Attachment / Detachment

Social-cultural-familial influences

On program related gains
On general development